NEWS IN BRIEF

CA $3 million shortfall

PROBLEMS with parts production at the Irvine, California, plant of Computer Automation have been cited by the firm as the main reason for $3 million shortfall in its planned worldwide sales for the third quarter, ended March 31, of its current fiscal year. CA says that the problems have now been solved.

ICL dispute over

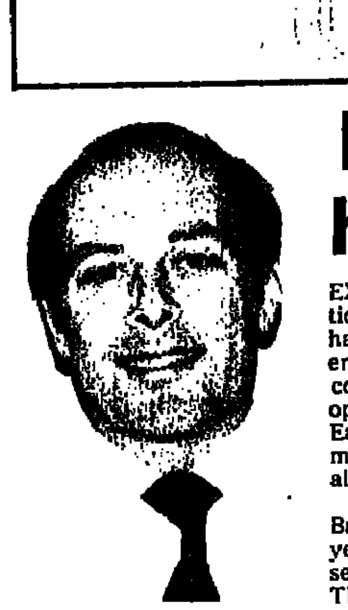
FOLLOWING a company offer of a meeting on April 11, ICL engineers, members of the Association of Scientific, Technical and Managerial Staff, have decided to end their work to rule which threatened to affect ICL users both in terms of support and the commissioning of new machines. The dispute was over a demand for talks on the question of engineers being provided company cars.

£100,000 order

AN order worth £100,000 for computer terminal equipment from the North East Thames Regional Health Authority has been won by Computer Marketing. Over 100 terminals are involved and they will be used to access a network of computers handling a variety of administrative functions.

CIS Cobol

A NEW version of CIS Cobol from Micro Focus, introduced by the company, incorporates two new resident utilities and several new Ansi standard commands. Known as Version 3, it has a typical compile speed of 200 program lines per minute on a system using a Z80 microprocessor.


Jefferson

Perkin-Elmer UK chief to head European operations

EXPANDING its European operations, Perkin-Elmer Data Systems has named Robert Jefferson, formerly general manager of the UK company as managing director of operations in Europe, the Middle East and Africa. This excludes Germany and France where there are already P-E companies.

Jefferson takes over from Nick Bark who resigned earlier in this year (CW, February 22), and his second in command will be Archie Thomas, previously general manager of the International Division in Europe. As deputy managing director Thomas will continue to handle international operations with responsibility for subsidiaries and the expansion of the distributor network.

Another senior appointment is that of Martin Walters, who joins the board. He is head of P-E's European Software Division.

Jefferson told Computer Weekly that marketing activities in Scandinavia were being stepped up, and a new subsidiary was nearly ready to go into operation in Holland.


Thomas

Burroughs first in distributed DBMS

WITH the first release of its networking software, BNA, now announced for delivery in October, Burroughs looks set to become the first manufacturer to have solved one of the key problems of distributed processing, namely the distributed database.

Details announced by the company last week show that application programs running anywhere in a BNA network will be able to update remote DMS II databases held on any other configuration in the network.

Only relatively trivial job control changes will be needed to address a remote rather than a local DMS II database.

Making the announcement, Burroughs' UK communications systems manager Peter Mcleod explained that it was the issue of remote databases above all that had delayed the firm's announcement of a networking architecture.

"A great deal of the basic software needed for networking was already in place in 1975," he said, "and there were factions who wanted to announce a Burroughs networking architecture then.

"As it is, by waiting till this capability has been developed, we have become both the first and the last in this field at the same time."

Mcleod went on to identify three other significant aspects in which BNA differed from one of the best known other systems, IBM's SNA.

"The first is that we offer an X25 interface as standard. In fact at the network control level, we can interface not only to packet switched X25 systems but also to SNA itself. All of this is controlled ultimately by Gemcos, which generates the required message control system.

"Another significant difference is that BNA has the ability to handle non-BNA controllers.

"Finally, BNA is not of necessity a hierarchical network, but readily caters for networks in which there is no single master host."

Release dates for BNA have also been announced, many details of which were first given last year (CW, October 19, 1978).

For large-scale Burroughs systems, from the B6800 upwards, BNA software will become available in October this year. Medium-scale users, together with B1800 users, will get first deliveries around the middle of 1980.

More PO strikes

THE Post Office is to come under renewed attack from over 1,000 members of the Society of Civil and Public Servants Association in its Data Processing Service, who voted last week to take selective strike action starting tomorrow (Friday) in support of their pay claim (CW, February 1979).

Creating a £20 million backlog of unprocessed telephone bills by earlier action, the men are seeking regrading and pay improvements.

"The Post Office narrowly averted a prolonged strike earlier this year by publishing regrading proposals," said an SCPS spokesman.

"Even without our parity claim, which the Post Office has recognised as being justified, Civil Service Pay Research Unit findings would indicate a pay increase of between 20% and 30%."

OEMs first market for Mas-M

DIGITAL Equipment has now made clear that firms engaged in manufacturing and finished-goods distribution will form the first market for the Mas-M applications software it is to market jointly with Hoskyns (CW, March 29).

The move has been met with cautious enthusiasm by the DEC OEMs most likely to be affected. By stimulating demand, they argue, DEC will open up new markets for everyone.

At the same time, they say, the deal will give a new respectability to commercial turnkey systems based on the PDP-11.

DEC will be selling Mas-M as the software component of complete computer systems built round the DECdatasystem-500 series. These incorporate either the PDP-11/34 or the PDP-11/70 as the central processor.

The systems will be marketed only by DEC's manufacturing, distribution and control division and are seen by the company as complementing products already marketed directly to end-users by this division.

These are the shop floor data collection systems sold by the industrial products group, a subdivision of MDC. DEC says that it is now working on the problem of interfacing Mas-M to the shop floor system, which also runs on the PDP-11 but under a different operating system, RSX.

Speaking at the formal announcement of the agreement last week, Geoff Unwin, managing director of Hoskyns' systems division, noted that three UK users had already gone live with Mas-M systems since the software first appeared last autumn.

These included Temana, a marketing subsidiary of Shell, and the Zockoll group, best known for DynaRod. Another customer had been Hamilton Rentals, which had bought the software in part on the technical strength of the in-built TP monitor.

Hoskyns, he said, already had around 300 users worldwide of the mainframe MAS system, which consisted of ten modules in all. In addition to those identified last week, these included accounts payable, bill of materials, material requirements planning, and purchasing.

Four elements of the system would typically cost around £15,000, he said, with the complete set priced at about £35,000.

Out of service

ITEL in the US is disposing of about half of its service bureau operation, accounting for about 5% of its total revenues. Itel's data services business is confined to the US and is separate from its IBM leasing operations and its plug compatible processor and peripheral marketing activities.

Boston bank to handle sell-off of leased 370s

THE big "sell-off" of leased IBM 370s in the US covered by the Lloyds residual value insurance policies (CW, March 29) is to be handled by the First National Bank of Boston, which will use several computer dealers to try to find new homes for the machines.

One dealer will be the Boston bank's own subsidiary, Randolph Leasing of Connecticut.

The agreement between Lloyds and the Boston bank will not substitute the obligation of a lessor holding a Lloyds policy to try to find new lessees for his insured machines, but it is intended to provide a means of disposing of a machine if the lessor's attempts fail.

Hundreds of 370s covered by the Lloyds policies will need to be disposed of this year or next because they are on seven-year leases written three or four years ago with early break clauses. Most of the lessees involved are likely to invoke the break clauses so that they can buy or lease one of the low-cost IBM mainframes.

Most of the 370s involved are unlikely to realise anything like their originally assigned residual values, and Lloyds could be faced with the biggest claims since the Darwin disaster of a few years ago.

Mini for teaching

TEACHING undergraduate students is the application for a Digico MTS/16E minicomputer delivered to the School of Mathematical and Physical Sciences of Sussex University. The machine is the biggest MTS/16E yet sold by Digico, and it will support eight teletypes.

Printed in Great Britain by Q.B. Limited, Sheepen Place, Colchester, CO3 3LE, and published by IPC Electrical-Electronic Press Ltd., Dorset House, Stamford Street, London, SE1 9LU.

COMPUTER WEEKLY

Number 648 Thursday, April 12, 1979 Price 18p

Briefing

Ask the wrong question....

A CRIMINAL record retrieved by computer and produced in court has turned out to be for the wrong man, after a manual check at the Criminal Records Office. A defendant at *Chelmsford Magistrates' Court was* attributed with a previous conviction that he did not have, because he had the same name as someone else on the file.

It was finally established that it was not the defendant's record that had been retrieved because he had no tattoo where the other man had one. A police spokesman said, "It wasn't the computer that was at fault. It was presumably asked the wrong question."

US control is eased

THE sale of a Univac 1100 system to the Soviet news agency, Tass, blocked by President Carter in protest over the trials of dissidents (CW, July 20, 1979), has now been given his personal go-ahead following "modifications" to the system. It is not certain, however, if Univac can *now sell the system* as Tass has *already contracted to buy an Iris-80 from* CII-Honeywell Bull to help it provide coverage for the 1980 Olympic Games.

Government aid

ABOUT £400,000 has been provided by the government towards research and development in computer-aided manufacturing of microelectronics, although there is no specific project in this area. This was stated in the Commons by Minister of State for Industry Alan Williams, in response to a question from Mrs Renee Short. She then asked why the Advanced Computer Technology Project was being disbanded. The Minister replied that support for its work was available through other DoI channels.

£3m PO order

THE Post Office has ordered PABX equipment worth over £3.3 million from GEC Telecommunications to be installed in government offices in about a dozen locations in the UK, including Cardiff, Doncaster and Norwich.

Micros and jobs

A ONE-DAY conference in Southampton on May 1 is to examine the effects of microprocessors on people and employment. It is organised by the Solent Productivity Association, and among the speakers scheduled are Albert Booth, Secretary of State for Employment, and Malcolm Peltu, former editor of Computer Weekly.

Prices drop

THE installed base of electronic typewriters in the US will reach $1 billion by 1983, according to International Data Corp of Massachusetts. In addition, prices of these machines should drop from the current $1,600-$5,000 range to $1,200-$3,500 by that year.

Pet prize for winning advertisers

WINNERS of the first Computer Advertisement of the Year competition, which was judged last week at the Computermarket exhibition at the Bloomsbury Centre Hotel, were John Ivinson and Yvonne Halliday from Altergo Software, seen here showing the winning advertisement promoting the Shadow II teleprocessing monitor. The advertisement was designed in conjunction with Masey Mukerjee and Russell.

Top prize of a Pet Commodore computer was presented by Kit Spencer, general manager of Commodore.

In the hardware category Data General received a trophy for their BP Nutrition Good Food Advertisement and in the miscellaneous category Scicon Consultancy International was awarded a trophy for its advertisement selecting a minicomputer: Are you on the right road?

Trophies were presented to the winners by Derek Nicholson, of British Computer Society Specialist Group for the Disabled, on behalf of Couchmead, the organisers. A cheque for £400, the proceeds of the entry fees, was presented to Nicholson, for use by the Specialist Group.

Govt chaos in 2970 switch

DESPERATE delays and backlogs were created in Hong Kong government departments by the changeover from ICL 1900 computers to a dual 2970 system. The problems have been described in detail in a report by the government director of audit in Hong Kong, a market valued highly by ICL.

The dual 2970 system was ordered more than two years ago, ICL having won the contract against strong competition from Univac (CW, January 13, 1977), but with the distinct advantage of being the resident supplier. The 2970s were to replace directly a 1904S and a 1903A.

One major user, the director of government supplies, said that there was a job failure rate of 10% on the 2970s and that even with successful jobs the average turnround time was twice as long as on the 1900s.

A spokesman for the Public Works Department said that the department was effectively worse off for computer facilities than it had been for several years, while the Commissioner for Transport talked about a loss of about 1½ hours of work a day at each of his licence offices due to system breakdowns that occurred twice a day, on average.

Delays of up to four weeks had arisen in the completion of statistics, according to the Commissioner of Census and Statistics, due to frequent system crashes and the less efficient

● Turn to page 9

Ireland wins race for Mostek factory

THE race between the Irish Industrial Development Agency and the Scottish Development Agency to attract the US semiconductor company Mostek to Europe ended last week, with the news that the Dallas, Texas-based company plans to move initially into a ready built *factory in Cherry Orchard*, a suburb of Dublin.

This will be the first phase of a three-stage plan to establish a full manufacturing capability in microelectronics. It will involve the testing of microprocessors and memory components shipped from the Texas plant. The second phase will involve a move to a 100,000 square foot factory in Blanchardstown where component assembly will be carried out. The final phase, expected by 1982, will require a second factory dedicated to wafer fabrication.

The Irish agency won the race because it could construct a better financial package to attract the company. It is offering development grants of up to 50% on capital spending, tax exemption on export profits until 1990, and from 1981, a maximum 10% tax on profits. The IDA had the authority to negotiate these terms directly.

The Scots to some extent lost because they did not have this flexibility. The SDA had to work with the Department of Industry on its proposals, and its offer fell through mainly because the DoI would not allow Mostek development grants under the 1972 Industry Act.

This was because Mostek was only prepared to commit itself to phase one of its plans. As this would not be a manufacturing operation, it would fall outside *the bounds of* the Industry Act legislation, and was therefore not eligible for a grant.

Computerview — page 2

Civil servants aim to hit harder yet

THE Government seems no closer to resolving its dispute with 500,000 civil servants after the two sides failed to reach agreement at a meeting last week.

The latest government offer still stands at a first stage of 9% (CW, March 22) with the remainder phased in by April 1, 1980, and as a result, new strike targets have been selected — although details were not available as Computer Weekly went to press.

According to Campbell Christie, deputy general secretary of the Society of Civil and Public Servants, on-going action will continue to bite hard.

"Our members are absolutely determined to continue with their action," said Christie, "even if it goes on for another four to five weeks."

The National Savings centre at Lytham, which houses Ernie, the Premium Bond computer, is still out of action, as is the Southend VAT computer centre, (CW, March 1).

For many farmers the future must look bleaker following a discussion in the House of Commons between Geraint Howells, former Liberal MP for Cardigan and Barry Jones, the Under-Secretary for Wales.

In answer to a question from Howells on what plans there were for paying agricultural subsidies to Welsh farmers, Jones replied that "... as long as the Ministry of Agriculture computer centre at Guildford is subject to industrial action, it is unfortunately not possible for farmers generally to receive the grants and subsidies nor-

● Turn to page 9

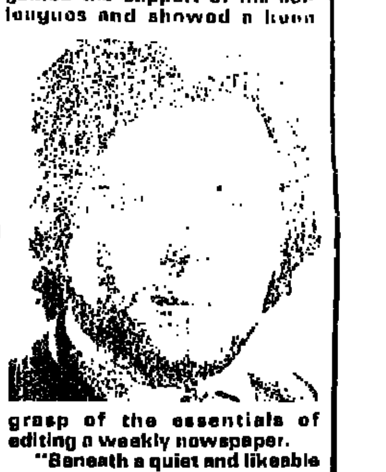
CW editor killed in car crash

IT is with great regret that we announce the death on Sunday, April 8 of Gareth Jones, editor of Computer Weekly, in a motoring accident.

He was being driven by a friend to report on the first heat of Computastars 79, of which Computer Weekly is a co-sponsor, when the car in which he was travelling was in collision with another car on the road between Bromsgrove and Hagley, Worcs. His friend and the people in the other car received only minor injuries.

Gareth Jones, 30, was appointed editor of Computer Weekly after a successful career as editor of a number of computer journals published by IPC Science and Technology Press.

CH WRITES. "In the short time that Gareth Jones was with Computer Weekly he gained the support of his colleagues and showed a keen grasp of the essentials of editing a weekly newspaper.



"Beneath a quiet and likeable manner there was evidence of determination and tenacity — qualities which would have taken him a long way in the career which was opening up before him. He will be sorely missed."

INSIDE THIS WEEK'S CW...

VALUE OF CONFERENCES

Conferences, in general, serve a valuable purpose; but their value is difficult to measure precisely. Nick Enticknap discusses the questions: How necessary are conferences? and How can we pick the best ones to go to? Page 11

VIEWDATA EN MASSE

Viewdata-like systems are under development in the UK and abroad, and plans for mass production are soon to be implemented. Donald Kennett looks at some of them. Page 14

BILLION BREAKTHROUGH

Robin Webster interviews Paul Ely, Hewlett-Packard's computer systems division vice-president on the performance and potential of his company, and its plans to break through the billion-dollar income barrier this year. Page 15

ALSO....

JOB VACANCIES PAGES 22-39

COMPUTER WEEKLY

Vol. 26 No. 648
Thursday, April 12, 1979

Deputy Editor
Tony Higgins 01-261 8696

Advertisement Manager
Harry Hutson 01-261 8359
01-261 8503

Class Ad Manager
Brian Durrant 01-261 8597

IPC Electrical Electronic Press Ltd,
Dorset House, Stamford Street,
London, SE1 9LU.
Telephone: 01-261 8000.
Telegrams/Telex: 25137 BISPRS G

Branch Offices:
Birmingham: 202 Lynton House Walsall Road, Birmingham 22B
Telephone 021-356 4838

Manchester: Statham House, Talbot Road Stretford, Manchester M32
Telephone 061 872 4211

New York: 205 East 42nd Street, New York, NY 10017
Tel (212) 867 2080 Telex 421710

Published weekly on Thursday

Registered at the Post Office as a newspaper. Price per copy 18p.

© IPC Business Press Ltd 1979.

CIRCULATION INQUIRIES
Requested Readership: 01-637 3636
Subscriptions: 0444 59188.

Members of Computer Weekly staff may be contacted directly on the extensions listed below. Other departments in Dorset House may be obtained by dialling (01) 261 8000.

EDITORIAL	
Keith Jones	261 8344
Tim Palmer	*261 8031*
Peter Howitt	261 8303
Rory Johnston	261 8025
Martin Banks	261 8808
Robin Webster	261 8170
Bernard Allen	261 8035
Donald Kennett	261 8719
Mike Marples	261 8042
Don Mitchell	261 8042
Chris Youett	261 8643
Nancy Pocock	261 8643
Judith Morris	261 8643
ADVERTISING	
Display	
Chris O'Hea	261 8658
Lloyd Collins	261 8743
Steve Bass	261 8293
Ian Carter	261 8109
Manchester	
Harry Aiken	061-872 4211
Birmingham	
Ken Parrott	021-356 4838
Classified	
Chris Prior	261 8028
Eddie Farrell	261 8097
Mark Williams	261 8019
John Farrar	261 8098
Ken Walford	261 8454
Nanette Gibbs	261 8174
Manchester	
Owen Kelly	061-872 4211
Birmingham	
Basil McGowan	021-356 4838
Production	
David Abbey	261 8016
Peter Regis	261 8615

Computer Weekly has a circulation each week of over 82,000 including the highest fully requested circulation in the UK. The International edition, which is published 10 times a year has a circulation of over 94,000.

Computer Weekly is sent free of charge to the following categories in the UK and Eire only: Company directors, company secretaries, management services executives, civil servants responsible for computing, management/computer consultants, lecturers and teachers, DP Manager/supervisors, systems analysis/O&M officers, programmers, operators, computer salesmen, field engineers.

ISSN 0010-4787

COMPUTERVIEW

A time to have bent the rules

RULES, according to the pragmatist, are made to be broken, and on occasions that should extend to include government legislation. Though often an agonising choice — whether a rule or law should be broken or not — there are times when it seems obviously necessary that such an act should be perpetrated.

Such an occasion occurred last week, when news leaked out that Mostek, the Dallas, Texas based semiconductor manufacturer, had finally decided to locate its new European manufacturing base in the Irish Republic, rather than in Scotland. The thing that finally tipped the balance towards the Irish was the inability (some have said refusal) of the UK's Department of Industry to bend the rules of the 1972 Industry Act to allow the company access to development grants.

The reason for this was that the Act specifically states that grants can only be paid to companies establishing a "manufacturing" operation. Though Mostek has an ambitious, three-phase plan for its European operation, it was only prepared to commit itself to phase one, a component testing facility.

Phases two and three, component assembly, followed by full wafer fabrication, would come later if the start-up was successful.

The obvious question is: why should the DoI bend the rules to favour an American company wanting to become a multinational? In Computerview's opinion, the answer is that a little pragmatism, where the rule bending actually harms no-one, and can benefit the whole country, seems an obvious necessity.

That Mostek is prepared to commit itself, totally, to only one stage at a time in its European plans simply displays sound business judgment on its part. It certainly does not imply any lack of intention to go towards stages two and three at the earliest moment — unless of course it all goes horribly wrong.

By following this step-by-step route, a route tracked by nearly every semiconductor company that has set up an overseas manufacturing operation, it will be able to start small, train a kernel of new staff with the new skills they will need, and grow towards a total manufacturing goal in a planned way. By starting with testing, these new staff will not be able fundamentally to affect the production process, but will add value to the products, and receive essential training.

Even though there are over a million unemployed people in this country, by far the most important statistic is the number of unfilled jobs that are left vacant through lack of skilled staff. It is on these jobs that much of the future of the country depends. The opportunity presented by Mostek to provide a "real time" training ground could have provided many of those skilled staff.

While the new recruits to Mostek will all be starting in the semiconductor business, and many will develop their skills and stay in the business, some will find other areas of interest relating to the business. They may move into applications, software, project management. All are areas where there is a desperate need for skilled people. By starting small, it will also add to the kernel of people needed by the semiconductor industry itself.

This is perhaps the major weakness to the UK semiconductor industry exposed by the creation of Inmos, though not necessarily a danger to the company.

By going for a complete operation from the start, it can only find staff from the existing UK manufacturers. It seems certain it will find the staff itself, for semiconductor people tend to be swashbucklers by nature, and like a new challenge. The other companies are bound to suffer, however. They many lose top people, who will be even harder to replace.

Getting Mostek into the UK would also have extended to contact between microelectronics user and supplier that is essential if new products that are not already obsolescent are to be made. Even politicians admit that it is on these products that the future wellbeing of British industry depends.

It seems sad that for the lack of a little bit of rule-bending, the UK has lost a new spawning ground for the needed skilled staff of the future. To rephrase Neil Armstrong, when he landed on the moon: "This is a small step for Irish industry today, but it's a giant leap for its industry of the future." Good on the Irish.

FOCUS

Whose finger will be on the data protection trigger?

HAD any of the distinguished members of the Data Protection Committee been present at a recent IDPM meeting, they might well have wished to preserve some personal privacy. Few present had a kind word for their report.

It was pointed out that in nearly 600 pages of privacy proposals, no mention was made of whose installation finger would be on the data protection trigger. Despite substantial evidence and statutory guidelines, not even the section labelled "hypothetical basic scenario of general requirements" tackled the important area of DP responsibility.

While much attention is being paid to the protection of data, similar care is not being afforded to the DP teams. With suggested penalties invoking the ultimate deterrent, prison, DP management is naturally apprehensive.

At the meeting the spotlight was well and truly beamed on the DP installation.

With the increasing emphasis on distributed processing, communication networks and the microcomputer, no DP individual could be expected to be fully informed of all these areas, let alone monitor possible infringements of personal privacy.

Certainly the company senior directors could not be held accountable. The chairman probably could not distinguish between WP and DP systems. Accountants, chief or otherwise, would be similarly out of their depth. They are far more at home grappling with cash flows than data flows. The only data the office manager likes to handle are holiday lists and expense returns.

Meanwhile, the sales manager would probably be more concerned with product dumping than data dumps.

Faced with a visit from the DP Authority, the company will quickly delegate full responsibility to the head of management services. He in turn will pass the buck to the DP manager who, given the choice of ensuring freedom of personal information or liberty, will lose no time in calling in his senior analysts.

All current work projects will then have to be buffered while the DP team pore over ill-defined, vintage program documentation.

Hugh Pitcher, from the National Computing Centre, emphasised the importance of good documentation and standards. Although the proposed codes of practice were flexible, there could well be a tremendous upheaval in all installations — with the one notable exception of police file records which are regarded by most as being reasonable and beyond legislation.

The NCC advice was, "If you don't need it — don't store it".

Only Ted Cluff from the IDPM believed that the proposals were the best set of compromises possible. Most others present at the meeting had practical reservations about privacy legislation. Few installations, it was suggested, could access meaningful information. Even payroll runs tend to be shrouded in code, mnemonics and anonymity.

In any case, personal information files are seldom held on computer systems. They are more likely to be locked away in a filing cabinet and therefore exempt from the Act.

However Colin Smith, chairman of the branch, produced several practical pointers, including the suggestion of a self-destruct button built into every application program and the establishment of off-shore data havens.

As a result, it would not be surprising if the Post Office reported a surge of interest in establishing direct data-comm channels between the UK and Liberia. And the sales of personal filing cabinets should likewise expand.

Ten years ago...

COMPUTER WEEKLY, APRIL 10, 1969

PIONEERING NCC director Gordon Black resigned to become *Professor of Computation* at Manchester University and director of the Regional Computing Centre at Manchester . . . ICL still led in the Eastern European market, but IBM had nearly caught up . . . Digital Equipment launched its first small computer, the PDP-14 . . . Potter Instrument filed a suit against CDC alleging infringement of disc and tape drive patents . . . A total of 35 stations were now linked to Boadicea, BOAC's reservations system-14 in the UK, 17 in the US, and three in Europe . . . In the Commons, Eric Lubbock said that legislation should control hours of work of young people at computer sites, which were not included in the Factories Act . . . A timesharing brokerage service, Instinet, centred on Kaydata's Univac 494, was set up in the US.

1984 and all that . . . .

WHEN the national and provincial Press write about computers, they often get confused, with results that can be very funny. Several readers sent in cuttings of different versions of this story; and £5 prizes go to the first two — Malcolm Curry of Keighley and Lawrence Watts of University College, Cardiff.

Don't annoy the computer or it may sack you, Britain's secretaries have been warned.

For 1984 has already arrived in some offices where machines can measure a typist's performance against an employer's target — and issue disciplinary warnings if it is not up to scratch. They can even time tea breaks!

White-collar union leader Mr Roy Grantham said that this was only one short step away from letting computers fire people who did not comply with their warnings.

"There can be no appeal against the judgement of a machine," he said.

Birmingham Evening Mail

The office staff's union, Apex, says that by the 1980s Britain's offices could be controlled by machines and run by "mechanical bosses." The union has pledged to fight the introduction of the chip, or microprocessor.

Daily Mail

Edinburgh may replace VME/B by EMAS

THE replacement of VME/B by EMAS on the ICL 2980 operated by Edinburgh Regional Computing Centre has again become a strong possibility since the issue was shelved in May of last year.

Writing in the latest issue of the ERCC newsletter, Peter Williams, deputy director of the centre, says:

"Since last May, the workload has risen, particularly through the introduction of a very large number of 'number-crunching' jobs, and the reliability of VME/B has improved.

"The total number of jobs run, however, is still small — at present about 300 jobs a day — and it is impossible to forecast when the machine will be able to provide a mixed batch/interactive service of the type and scale originally envisaged and still required.

"A full connection to the regional network has also to be achieved."

Williams goes on to note that the centre is therefore being forced to reconsider the possibility of a change of operating system to enable the service objectives to be met.

A change to EMAS is therefore a strong possibility, he says.

To help existing users, a period of overlap would be required, with a VME/B service continuing until at least the end of 1979.

EMAS, an operating system originally developed by Edinburgh for its ICL System 4 started pilot running on the university's 2970 early last year (CW, January 26, 1978). It went into full operational service on the 2970 at the beginning of the current academic year.

June launch likely for Texas' personal systems

THE multi-pronged entry into the personal computer market by Texas Instruments now seems set for June, when a public announcement is expected. Though the company refuses to comment, there are now strong pointers to as many as *four* systems being included in its range, incorporating such features as plug-in firmware packages, and the novelty of built-in speech synthesisers.

Consultant Ben Rosen, of New York stock analysts Morgan Stanley, has predicted in his latest newsletter that TI will unveil two systems at the Chicago Consumer Electronics Show in June. Known as the 99/3 and 99/4, they represent the low-cost home market entry, and the professional market entry of the three systems predicted last year (CW, August 24, 1978).

The type numbers are interesting, because they indicate that the systems may well be using TI's *family* of microprocessors as the CPU. If so, they will be among the first 16-bit personal computer systems to hit the market.

The low end model, according to Rosen, will cost $500. With just 4K bytes of RAM, and requiring the use of a TV set as a display, it will be in direct competition with such systems as the Video Brain and Tandy TRS-80. Software will be in ROM, and TI will be supplying plug-in applications and games programs.

The real novelty with the 99/3 will be the option of a $90 speech synthesiser, almost certainly based on the chip set used in the company's successful Speak 'n' Spell learning aid.

Rosen suggests that it is this model in the range that has been the subject of approval problems with the Federal Communications Commission in the US (CW, January 11).

The second system, the 99/4, seems set to be a competitor for such computers as the Apple II. The predicted retail price is $1,000, and it will feature a minimum of 16K bytes of RAM, expandable upwards, and a built-in 13-inch colour monitor display, while a range of peripheral systems which includes two types of printer and a minifloppy disc drive will also be offered. A speech synthesis capability is also expected to be available. Again, a range of plug-in firmware applications programs will be provided.

The third system in the range, a small business system known as the 99/7, has been put "on hold", according to Rosen. With an expected price between $3,000 and $5,000, it was predicted last year that it would be capable of handling large databases.

There is some speculation in the industry, however, that this system is to be included in TI's public announcements on the range, and that the system "on hold" at the company's Lubbock, Texas, factory is in fact a fourth and more powerful member of the range. TI executives refused to comment on the speculation last week.

Comart aims to manufacture

WITH a turnover that has grown from nothing to about £2 million in two years of business, built up on the UK distributorships for Cromemco, North Star, and Processor Technology microcomputer systems, Comart is now actively eyeing market opportunities for entering the business as a manufacturer.

The company has already dabbled in the area, with the launch of its own Micro-Box system at the end of last year. Based on a single board computer in a simple chassis, this served the joint purpose of evaluating the organisational problems of adding a manufacturing operation to the main stream of the business, while filling a particular market opportunity seen by the company.

According to Comart marketing director, John Lamb, this will be the way the company will enter into full scale manufacturing. "*We are not aiming to compete with the products of our suppliers*", he said, "we are rather looking to fill specific market requirements. There are plenty of holes to be filled".

He declined to comment on the specific products being considered, primarily because manufacturing is not due to start until the end of this year. This is when the company will move into a new 10,000 square foot factory and office complex in Eaton Socon, just outside its home base of St Neots, Huntingdonshire.

As a stopgap until the facility is completed, Comart has temporarily had to move into a rambling, listed building in St Neots, at 12 Huntingdon Street. This has been required because of the company's rapid growth, both financially and in headcount. The latter is now starting to rise sharply. From starting with the two founders, managing director David Broad, and John Lamb, Comart now employs 12 people. By year end, this will have risen to 35.

Among these new recruits will be a hardware design engineer and a software support specialist—when they can be found. Both directors admit that locating the right staff is a current problem.

The software support specialist will be responsible for developing a second string to Comart's "manufacturing" effort, that of business-oriented software packages.

The move into manufacturing will be carried out without outside financial assistance. According to David Broad, the company's current growth rate of 15% per month provides sufficient resources to fund the move internally. He is more than pleased with this growth rate.

Comart's marketing director, John Lamb, holds the MicroBox, the company's first venture into manufacturing. With a move to a new factory scheduled for the end of this year, Comart now plans to enter the manufacturing arena proper. Like the MicroBox, the products it makes will complement rather than compete with the US systems it sells in the UK.

Forth features combined

THE major features of the two versions of the Forth language — miniForth and *microForth* — have been combined by the designers into one new version, called polyForth.

In addition to the RCA CDP1802, 8-bit microprocessor already supported by the microForth version, the new variant is available for the Texas Instruments 9900, 16-bit micro, as well as the ubiquitous Intel 8080.

By the end of this year, it will also be able to run on Intel's 8086, DEC's LSI-11 and PDP-11 *families, plus the IBM Series 1* and Honeywell Level 6 minicomputers.

The new variant offers a faster dictionary search algorithm, all 16-bit arithmetic, a more secure multiprogrammer and a simpler target compiler. The designers, Forth Inc of Manhattan Beach, California, claim that this compiler provides several advantages over the previous cross-compiler. These include the ability either to execute the compiled code directly, for testing purposes, or output it immediately to any desired media.

The standard polyForth package uses 4K bytes of memory with an additional 2K bytes for the assembler and text editor.

'Make govt departments pay for own computers' says Civil Service

GOVERNMENT computers in future should be paid for by individual departments out of their own budgets, instead of from the Central Computer Agency's Computers and Telecommunications Vote, according to a Civil Service Department proposal.

This will ensure that departments value the service they are getting and balance it with other administrative costs, says the CSD.

The CCA will continue to be responsible for the efficient use of computers in government, and will carry out the procurement of equipment either by purchase or hire, but will be paid back by user departments which will have to find the money themselves. This means that the decision to buy a particular machine will be balanced not against other departments claims for computers, as at present, but against the other claims on the purchasing department's administrative budget.

These arrangements are expected to start operating in April 1980. Parliament will have to vote money for computers to separate departments from then.

Bureau services within the government will operate in the same way, with the CCA Computer Centre charging for time used, as will other departments that share their computers.

According to the proposal, this "will ensure that departments value the service provided properly in relation to alternative ways of getting the work done."

Level 6 Pascal

AN extended Pascal compiler that runs on Honeywell's Level 6 minicomputer has been developed by a US software house, California Software Products Inc, of Santa Ana, California. The compiler operates under MOD 400 or 600 operating systems, on a minimum configuration including 128K words of memory.

[illegible]

Downtime

by Chad

North of where?

THERE has been a new twist in the battle between English regions to attract electronics factories. A full-page advert has appeared in the Wall Street Journal screaming, "Come to the North of England!" Playing on Americans' penchant for nostalgia, it says, "We started the world's first Industrial Revolution and we're helping to achieve the second in high technology and sophisticated engineering."

But then it adds, "We speak your language."

Oh? Is that what an American businessman is going to think when he arrives in Salford and someone says to him, "There's nowt as queer as fowk?" What on earth will he imagine chip butties are? Probably some new substrate fabricating process.

To cap it all, the advert showed a picture of the Tower of London. I've heard that the North of England starts at Watford, but at Whitechapel? That's a new one!

The numbers game

SOMEONE rang directory inquiries in New York the other day and was told he couldn't be given the number he wanted because the computers were out of order. "Can't you look it up in the phone book?" he said.

The operator replied, "This is the modern age, sir. We haven't any phone books — only computers. But the computers are broken."

"Before it'll talk it wants US to prove that there is human intelligence."

Crime: Time for advice on ethics

IF my vision of the 1980s proves correct, then it is time computermen stopped hiding behind the hardware and came forward to give an increasingly bewildered public some sort of guidance through the ethical jungles that lie ahead.

I speak of crime and terrorism, both on the increase in a world whose moral values are evidently changing.

Computing offers no ultimate solution to either, but it does provide a set of powerful detective and preventive tools — if we have the nerve to use them.

Computer specialists alone understand the full potential. Only armed with this understanding can wise decisions be made about the social cost of exploiting this potential.

Today in the UK, a policeman cruising in a patrol car anywhere in the country can, on a whim, lift his intercom receiver, relay a licence number to his headquarters and within 25 seconds or so be told the owner's name, when the vehicle was last stopped, for what reason, and so on.

The UK is not exceptional in this respect; the same service is available to most European and American policemen.

We have accepted this, in principle a gross intrusion into our privacy, as a necessary compromise in the interest of combating crime.

The more armed robberies, muggings and bank heists we read about, the more convincing becomes the standard law-and-order argument that he who commits no crime has nothing to fear.

In my view it is reasonable to assume that the likelihood of the innocent being pushed about due to computerised surveillance is less than the same happening due to an archaic law like "loitering with intent."

When the original Great Debate about police databanks was at its height in the late 1960s, there was a comforting argument propounded by computer "experts" that the hardware cost of full-scale individual surveillance was so enormous that it provided an effective deterrent.

The argument is no longer true. Hardware costs are fast becoming insignificant, and the software involved is relatively unsophisticated. At the same time the socio-political pressures have begun to change.

Opinion is hardening against criminals and terrorists, and the civil liberty lobby's argument on principle seems to be bowing to a more pragmatic approach based on a sort of balance between privacy and crime prevention.

I am scared, though, that terrorism is going to become the major threat to civil liberty in the 1980s. The terrorists are getting technologically smarter.

So far they have only threatened the indiscriminate blowing up of aircraft in mid-flight, but I do not doubt that they have, or are close to having, the means to carry out the threat.

For a finite period of time the threat is scarier than the actuality.

But once the first aircraft is blown up, others are bound to follow and in no time the basis of unrestricted air travel could be seriously eroded.

But there are many potential terrorist actions which are too horrible to contemplate.

Could an aircraft, filled with explosives, set on automatic pilot and aimed at the White House, be stopped in time? I think not. It took security staff five minutes last year, to discover that a helicopter landed in the White House grounds, completely unauthorised.

Could any computerised system keep tabs on the disgruntled military? Or how could someone be barred from renting a room in a tall building, filling it with conventional explosives carried in bit by bit, and then, having set up a telephone-actuated trigger mechanism, holding a whole city to ransom?

In general terms, the problem is that mass surveillance, the use of voiceprint recognition techniques to identify phone conversations and similar anti-terrorist weapons not so far being used (or not admittedly, anyway) are no guarantee against the crime.

They are a putative step in the right direction; they might net a few terrorists — but in time? And at what cost?

In the process the theoretical human rights of many people would be trampled on, and the risk created of flagrant misuse in the wrong hands of techniques that, arguably, no executive power should be allowed for the sake of its own uncorruptibility.

As computermen it is not our place to take the moral decisions on this sort of question perhaps; that is something the politicians will have to do on our behalf. But it is very much our place to tell the politicians, and everyone else who is listening, that our technology is fallible. It provides no sure answers, no guaranteeable safeguards.

We have to tell them about the recognition failure rate of voiceprint, for instance, is quite high once you start increasing the number of known identities beyond a tightly-knit group of 25-30 people.

COGARVIEW

Computer specialists alone understand the full potential...

They have to decide whether a predictable number of ghastly errors (with innocents thrown into jail, deported and the like) is part of the price we must pay for legitimate use of the technique in anti-terrorist and anti-criminal activity.

Once the politicians have decided, they can safely be left to put the right kind of public-interest gloss on the practices they adopt. That is why we, the specialists, must beware of allowing outsize claims to be made for technology that the man in the street has to take on trust.

Current airport security measures are a case in point. There is a strong feeling in the US now that the right to snoop periodically at what we are carrying around with us is the government's *quid pro quo* for allowing us to fly.

Security searches may pick up a few nuts, OK; but any reasonably intelligent person who wants to get a gun or explosives aboard an aircraft can still do so.

In current US thinking; the equipping of dinky little airports with innumerable guards going through the hand baggage is an intrusion, the value of which has not been conclusively demonstrated.

What all this boils down to is the price-tag we attach to freedom. Are our personal liberties, as we know them today, worth having a few hundred people blown up?

Note that I avoid saying "having a few hundred people blown up in an incident that could have been prevented." That is too arrogant a claim.

The thorny problem lies in establishing a system or systems that constitute a definite threat to personal liberty, but which only *may* provide the protection that we seek.

That's the general question. Our responsibilities in the computer industry are greater when it comes to the more specific consideration of computer crime and technological preventive measures.

What worries me most – and I make no apology for returning to a theme which I have expounded on various European platforms before – is encryption as the foolproof means of data security.

It isn't yet – but it will be in the 1980s if we are not careful.

What's wrong with encryption? In my view its potential criminal value far outweighs its value in preventing crime.

Why did – and apparently does – so much Syndicate money go to back civil liberties campaigns against wire-tapping in the US? Simply because wire-tapping is society's currently most effective weapon against organised crime.

With effective encryption, anyone can send messages to anyone without any third party being able to crack them within a useful period.

Two groups of people who ought to be able to access data will be locked out by effective encryption: law enforcement agencies and auditors.

Companies, and anyone else operating an encrypted system will be able to deny knowledge of any part - or all) of that system entirely selectively.

OK, we can apply sanc[illegible] we are even aware of [illegible] going on, but if the conceal[illegible] of the data is more importa[illegible] than, say, a *finite prison* [illegible] the data will remain co[illegible] with people pleading [illegible] Amendment. There is no p[illegible] last resort where disclosure [illegible] become mandatory.

At least with the IBM proposals now adopted by the National Bureau of Standards there remained, in the opinion of many mathematicians, a considerable probability that decryption stayed within the province of, say a security agency with an extra-powerful number cruncher.

They just weren't quite that secure, some believe deliberately. But the latest developments in encryption at MIT promise a public-key technique which will exclude even that long-stop safeguard.

The evidence in the US is that individual and corporate computer crime now totals at least $300 million a year. The average haul from computer-related bank embezzlements, for instance, is calculated to be $500,000 – or 25 times as much as a typical non-computerised embezzlement.

Auditors are worried that they are increasingly taking the rap for finagling about which they knew nothing, and the details of which they had insufficient powers to unearth.

Discussions have now been started on giving auditors greater powers, but encryption could negate all that.

It is particularly worrying that society appears so tolerant of computer criminals.

In the first place it is worrying that so many intelligent, motivated white-collar workers who would not dream of burgling a house see nothing much

● Turn to page 13

Atkins On-Line in link-up with LUCS

ATKINS ON-LINE of Epsom and London United Computing Systems will probably be sister companies soon, following the acquisition of the Epsom bureau's US parent, On-Line Systems of Pittsburg, by the big US holding company, United Telecommunications.

United Telecommunications already owns United Computing Systems of Kansas City, whose European arm is United Computing International of which LUCS is the UK operation.

OLS will operate as a subsidiary of UCS, but is expected to retain a high degree of autonomy. The president of UCI in London, Graham Barrett, and the managing director of Atkins On-Line, Dr Dennis Chandler, commented that the services of their respective companies complemented each other.

United Telecommunications is one of the biggest common carriers in the US aside from the communications giant, AT&T, and chalked up profits of $160 million on a $1.43 billion turnover last year.

UCS contributed $76 million of this total from operations like its Uninet network which covers most parts of the US and Western Europe and embraces the LUCS centre in London.

LUCS runs two CDC 6500s in London, while the hardware line-up in Kansas City includes two CDC 6400s, three 6600s, one Cyber 174, twin Cyber 175s and a Cray 1 supercomputer. Time on the Cray 1 machine is now available on a bureau in Europe.

On-Line Systems operates a line-up of Digital Equipment DECsystem 10s in Pittsburg, while Atkins On-Line at Epsom has one DECsystem 10, which it acquired after it was taken over by OLS in 1977, and two RXDS Sigma 9 machines.

OLS revenues in its fiscal year ended January 31 came to nearly $28 million, one-third of which was contributed by Atkins On-Line.

OLS and United Telecommunications signed an agreement in principle on March 30 under which United would issue 1.26 shares of its common stock for each OLS share. A total of 1,835,000 United shares worth $34.7 million would be issued. The deal is subject to OLS shareholders' approval.

Itel AS/3-5 trade-in deals for US customers with 370s on lease

FACED with the daunting task of building up a customer base for the AS/3-5 IBM look-alike processor, before IBM starts shipping the low-cost 4341, Itel has started to offer trade-in deals to customers in the US that have IBM 370s on lease.

Itel has two distinct IBM oriented business operations: leasing IBM's own machines on a third party basis, and marketing the IBM compatible Advanced System series.

Last month Itel let a customer in North Carolina out of a seven-year lease on a 138 after just one year, and exchanged the 138 for a two Megabyte AS/3-5.

The customer was Salem Carpet Mills of Winston-Salem, and Itel delivered the AS/3-5 to the firm just one day after they signed the contract. A source at the carpet company said: "They must have had a truck circling our building."

Itel's main selling point for the Advanced System series in general and for the AS/3-5 in particular is very rapid delivery rather than lower cost. The AS/3-5 more than matches the 4341 in power but it costs twice as much to buy as the IBM machine.

To get round this problem, Itel is offering the AS/3-5 on an 18- or 24-month lease at charges that work out less than renting a 370/148, thus making the AS/3-5 a more attractive alternative to the 148 for a user who needs more power and cannot wait for a 4341.

Short leases written on AS/3-5s now will terminate around the time that IBM starts shipping 4341s in volume, but Itel hopes that it will not lose many users because it will offer to renew the leases at reduced charges. The AS/3-5 also offers significant advantages over the 4341, including an eight Megabyte maximum main memory capacity and MVS support that is not available from IBM with the 4341.

Even chance Tories will back micro policy

THE chances were about 50-50 that the Conservative Front Bench would accept the policy on information technology proposed by Ian Lloyd's working group, according to the former MP (CW, April 5). Lloyd went on to say that although up to now political recognition of the dramatic changes in human affairs that microelectronics will bring about, had been meagre, more and more MPs were now becoming conscious of the problems.

Lloyd also expressed the view that private enterprise was not succeeding in exploiting the potential of new technology, partly because of the equivocation of successive governments over support for the mixed economy. For this reason Lloyd felt government involvement in promoting the micro was *necessary, at least for the* time *being. Referring* to the NEB, he said, "We mustn't take away the crutch until the patient can stand on his own." The crutch should not have been needed in the first place, though.

Lloyd was adamant that proper development of the economy would lead to more jobs rather than fewer, but we had to persuade people to be more ready to change, and we had also to reform the tax system to reward innovation. It would take at least two parliaments to establish these new attitudes, he said.

Adrian Norman, a consultant with Arthur D. Little and author of the working group's report, thought that people's inability to change was often exaggerated. In 1940 because of the war, he pointed out, 85% of the people between 18 and 60 had retrained successfully. We had to create a climate in which people wanted to change, he said, whereas at present it paid them to resist it.

It was totally wrong, Norman went on, to make organisations which needed to change pay a penalty in the form of redundancy money. That slowed down change, and society was the loser. Since society benefited from change, it should carry employees over from one job to another.

Norman: Inability to change exaggerated...

The institutions set up after the war, Norman said, were appropriate for the 1930s, not the 80s and 90s. He cited union structures and town and county planning systems, adding, "We have an extraordinary capacity to stop things happening." Worker participation, he said, would only slow up decision making.

There was enormous potential for the British economy in the further establishment of the City as an information processing centre for the world in many fields of commerce, especially since most international communication was carried on in English. There was also a very large market for micro-based consumer products in OECD countries.

Lloyd expressed the view that the efficiency of an organisation's internal information processing was the key to its success. IBM's was much better than the UK government's, he suggested, and Honda was better than British Leyland at analysing market information.

Although Lloyd's group is in favour of continued government support for the micro, there is still considerable doubt about the likely effect of a Tory win in the election.

Scots agent for Harris

HARRIS Semiconductor has appointed Phoenix Electronics as its representative in Scotland. Phoenix, which was founded in 1972, will market the full range of Harris Semiconductor products and provide a design advisory service. The company will be exhibiting the Harris range at the All Electronics/Seminex Exhibition, which is to take place in Edinburgh from May 15-17.

Phoenix is located at Western Building, Vere Road, Kirkmuirhill, Lanarkshire.

IBM adds a programmable PoS system for small retailers

IBM has added to its line of point of sale equipment with a programmable system for smaller retail outlets. Called the 3680, it can communicate with a 370, 3030, 4300 or 8100 system.

The 3680 is a diskette based system and provides features found on bigger PoS systems like credit authorisation and price look-up.

The heart of the 3680 system is the 3684, a combination of terminal and control unit, that incorporates 950,000 characters of diskette storage.

The 3684 can operate either in stand-alone mode or as a master register controlling a cluster of attached registers. The attached register is called the 3683.

IBM is offering two new application program products with the 3680, both of which can be customised. The sales program provides facilities like price look-up, credit authorisation and operator guidance. The store administrative program enables the user to update diskette files and to carry out inquiries into records maintained on items movements, loans and withdrawals.

GILB'S MYTHODOLOGY

Putting old forms and codes on new screens

SOON there will be more display screen terminals than civilised people on earth. In the rush to move the hardware in quickly, we are all too often tempted to convert the current system design by moving the familiar computer data input form, and the codes that belong to it, on to the screen.

There can be some very good reasons for doing so. The keying to the terminal may be based on that form, and the people in the organisation may be very familiar with that form and the codes. The intent and the solution are both good, except for a few details.

Display terminals are not equivalent hardware to the paper form. They cannot directly replace it. Forms designed to be used by human beings may function very poorly when used by a computer. Just to mention one critical difference: On a paper form, the human can *easily* access, change or fill out any part of it "at random". The typical display terminal tends to restrict this randomness. Light pens and touch-sensitive screens are not yet the norm. The paper form *assumes* random access ability on the part of those who fill it out or modify it. The typical screen display terminal and associated programs tend to force sequential skipping from field to field.

There is another set of important differences between the paper form and the display terminal. The paper itself is unable to sense what has been filled out on it, to evaluate the content or to relate the content to files. The terminal, as we are all aware, often has or can have these possibilities at the same time as each field is being given to the screen form.

It seems a shame to have developed such a powerful tool as the present computer, only to disregard its possibilities and bow to the traditional limitations of a paper form.

There is a compromise. I have been surprised to see how rarely it is used in the multitude of designs where it clearly would have been a benefit.

The basic design is to allow input data elements to be entered independently of the content, sequence and format of the form. The data elements should come in in their *natural* sequence, their *natural* format and their natural context of related data elements. The computer program should be responsible for deciding *which* data element is intended, *how* to convert the input field to the conventional display format as found on the form, and *where* to place the converted standardised format data on the standard form.

The whole subject of handling natural codes in natural sequences tends to disturb most professional programmers and designers who have been brainwashed by conventional data processing input design traditions. They tend to assume it can't be done, and can list 100 reasons why it won't work in their particular case. If you feel this way, it is natural, and if you want to know how to handle natural data, the kind humans preferred before the punched card days, you can learn about it. In fact you could teach yourself by programming what people practice in order to fill out the forms! But a detailed text on the subject will be found in Humanised Input (Winthrop-Prentice-Hall 1977).

If, for example, you input 30 OCT, the computer will be programmed to guess that this is a date (for obvious reasons) and to fill out 78-10-30 in the field for date. If there are several date fields it will try to decide in context of other inputs which one is intended. If in doubt it will be programmed to ask for help. If 28.69 is input, the program might work on the assumption that the amount was keyed. It might fill out 00028 69 on a form, and might confirm that the amount was reasonable, by limit checks, by pattern checks or by reference to the files. Maybe the amount was one of eight current price categories for product 23456, and the price is actually used as an identifier to select the size and design of a shirt. The computer might at this point even fill out the correct product colour, size or design on the screen.

Naturally all this will require far more design, programming and analysis. It will also require more hardware resources to support. But in high volume applications (and why else would we put it on a computer?) or in high reliability applications (that *is* another possible reason) the benefits of being able to work directly and in native human codes will outweigh the costs and make this sort of thing a good investment.

This short column is not enough to explain in detail, convince the sceptical or illustrate that this applies to *your* case too. But I hope a few of you were stimulated to avoid raw copying of the old form on to the screen!

Way to device independence

PROGRAMMER NOTES

ONE interesting aspect of IBM's 4300 series is the company's return — after more than 10 years — to the use of non-removable discs.

Described by IBM as combining high performance with low cost, these are the 3310 disc drives — available on the 4331 only — and the 3370, available on both new processors.

DASDs incorporating non-removable discs are of course likely to be more resilient than similar drives using removable disc packs. In this, the new devices are closely in line with the general robustness of the 4300 series — which does not need air conditioning and can be powered from a standard 13 amp socket.

Non-removable discs could also be seen as a way of selling more hardware, as there is no alternative to buying a new drive when disc space runs out.

One aspect of the new disc that has led to much speculation is why they should use a radically changed method of data recording, namely Fixed Block Mode (FBM).

From the standpoint of the CPU, FBM does away with the usual addressing scheme of cylinder and track. It replaces it with what ICL has been using for years, a simple relative block number.

Although IBM may have other and more cunning reasons up its sleeve, it has been noted that FBM can thus be seen as a hardware extension to VSAM — itself fast becoming IBM's standard file access method.

When VSAM was introduced to supersede ISAM, cylinders and tracks were turned into the much more flexible concepts of "control areas" and "control intervals". One advantage of this was that VSAM files could then be moved between different disc types with the minimum of trouble.

It was still VSAM's job, however, to turn device-independent I/O requests into I/O commands involving cylinders and tracks. VSAM and thus the CPU, was still very much concerned with precisely how files were organised on disc.

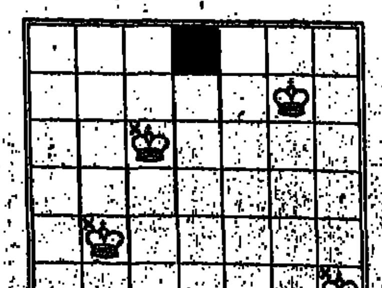
FBM has now done away with this, opening the road to back-end processing.

The central processor now no longer needs to know the physical details of file layout and there is speculation that virtual discs might now be created which have no physical counterpart.

These could resemble VM's minidiscs, but with complete device independence.

Puzzler

IN past years, recreational mathematicians have tended to neglect all "grids" other than the 8 x 8, since the chessboard is where most game theory analysis has been carried out. So here is a problem to adjust the balance a little, involving a 7 x 7 board with four chess Queens placed on it.



The task is to move the three Queens marked X to new positions, so that all 49 squares are either occupied, or attacked in a straight line by at least one of the pieces. (At the moment, the two shaded squares are unattacked). The unmarked Queen must remain on its original square, and all three "moves" must be legal straight-line chess moves made horizontally, vertically or diagonally.

See page 37 for solution.

SOFTWARE FILE-1

Identical specs for Pascal is aim of British Standards

AN early milestone in the standardisation of Pascal has been reached this month with the publication of the first draft by the British Standards Institution.

Document No. 79/60528 DC. It is available from the BSI General Office, 101 Pentonville Road, London, N1 and is priced at £1.50 to BSI members, £2.00 to others. Those applying by post are asked to include a self-addressed label.

In line with its normal practice, the BSI has set a two-month period for comment on the draft standard. The end of May is thus the closing date for the receipt of comments, including those from the ISO countries to which the standard has also been circulated.

The British intention is that the BSI and ISO standards should be the same, so that ISO reaction is critical to the plan to publish a revised document at the end of the year on which a vote can be invited.

The document is also significant in being the basis for work by the newly formed Ansi committee, X3J9, tasked with devising a US standard for Pascal.

The BSI document is understood to be the base draft accepted by X3J9 and could become an Ansi standard within a relatively short timescale. This would then allow the committee a longer period in which to consider the more difficult questions of language extensions.

Ten years on for George 3

ICL's George 3 operating system is 10 years old this month. Its first release appeared on April 1, 1969. An anniversary celebration has been arranged for those who have been closely associated with the product for the evening of Friday, April 27.

It is restricted to those who have at any time been involved with the development of the system — including maintenance, integration, and validation — the production of user manuals, or anybody responsible for supporting the product who has had close links with the development team.

Further details are available from Roy Walker, who has arranged the event, on Brackn[illegible] 26024, or from Mick Bailey (Reading 472803) or Brian E[illegible]ton (Wokingham 790022).

Ships' library expanded

PREVIOUSLY restricted to ships exceeding 4,000 gross tons, the ship characteristics library maintained by Mardata has been expanded to include all ships over 1,000 gross tons. Data including 76 fixed items of information per ship is no[illegible] some 31,000 vessels wor[illegible]

Mardata is jointly ow[illegible] Lloyd's Register of Shi[illegible] Lloyd's of London Press [illegible] Marine Management Sys[illegible] Inc, of Stamford, Connect[illegible]

SOFTWARE FILE—2

PETER HEWITT REPORTS ON ONLINE'S MVS CONFERENCE

THE decision facing IBM big-system users is now no longer whether to convert to MVS, but when.

This was the recurring message from speakers at last week's Online conference dedicated entirely to IBM's top-of-the-line operating system.

With hardware costs down to £15,000 per Megabyte on the 4300 series, the high resource requirements of MVS would soon no longer be an obstacle, it was argued.

The functional and performance advantages of MVS were also cited as helping to overcome user resistance.

But perhaps of most significance, the time could easily be seen when IBM would offer just three mainframe operating systems: MVS, DOS/VS, and VM.

"SVS support is to be dropped from the end of this year, and the future of OS/VS1 looks uncertain," said the conference chairman, Alan Liebert of Computer Management Services.

"Although the 4300 launch was accompanied by a new release of VS1, few of the 4300 devices are supported and there is no evident growth path for VS1 users. The 303X machines already support VS1 notably less thoroughly than they do MVS."

This theme was later reiterated by Warren Hood, of Itel International. Disclaiming the advertised title of his presentation — "The rationale for a move to MVS" — Hood said:

"There is no rationale: you have no choice. It's not a question of why, but when."

He went on to remind delegates that the need for a sophisticated operating system stemmed from the need to utilise resources optimally.

"The SCP is the tool you have to get work done, given a certain elapsed time and a CPU and other resources. Its aim is to make use of every possible bit, track, and memory cycle that the configuration has available."

A critical factor here, he said, was the number of multiprogramming levels supported.

"VS1 already applies to a very limited hardware group. On a smaller 148 and below, you would run DOS/VS, while on a larger 158 and above, only MVS has the ability to drive the CPU at full utilisation.

"VS1 then only applies to a large 148 or a small 158. And it isn't very appealing because of its low multiprogramming level in regard to large machines and its physical size in regard to small machines."

"Super DOS" — in the form of Release 35 and 36 — was, he said, just round the corner, implying that either DOS/VS or a cut-down form of MVS could fill the gap if VS1 were to be scrapped.

"There would then be one SCP for the lower range of machines — DOS/VS — and one SCP for the upper range — MVS. This approach makes sense and bears the beauty of simplicity."

VM, he noted, could not be considered a general purpose SCP as no "meaningful" batch work could be done under it.

Although not all the speakers were convinced that VS1 was disappearing, the remarkably high attendance at the conference suggests that a great many OS sites are in agreement with the general thesis and now see a future conversion to MVS as inevitable.

Security, stability impress users

HIGHER security, greater stability, a clear growth path, and more extensive control facilities — all cited by IBM as advantages of MVS — are beginning to weigh heavily in its favour in the eyes of users too.

And it is clear that the need to support multiprocessor configurations together with growing TSO workloads have been important additional factors in overcoming user resistance to IBM's giant operating system.

Steady improvements in MVS — first released in 1974 and now almost certainly attracting the bulk of IBM development effort — have also helped.

"Until MVS 3.7 was announced," explained Jim Manderson of the Post Office data processing service, "we considered that the expected cost of MVS in terms of extra hardware and suspected reduced performance in our environment outweighed the claimed advantages.

"With this release and the new SRM it was felt that the balance *may have been tipped.*"

On investigation, the PO found that with 96 TSO users, a batch job stream, and 5 Megabytes for MVS:

a) MVS TSO throughput was 10 per cent worse than SVS;
b) MVS batch throughput was about the same;
c) MVS TSO response was 17 per cent worse than SVS;
d) MVS used 3 per cent less CPU than SVS.

"With these results, and confidence that MVS could be improved with further tuning, it was considered that the benefits of MVS did outweigh the costs and a conversion was authorised. VSPC and MVS/SE were seen as important attractions in reaching this decision."

Although the PO runs MVS on a uniprocessor 168, the fact that only MVS and VM support multiprocessor configurations was a significant factor in the case of another user, the Royal Insurance Group.

"Under MFT on a 1½ Megabyte 158, we were suffering from about one unscheduled IPL a day due to both hardware and software failures. This had no small impact on our TP operations."

The advantages of a multiprocessor configuration led the Royal to combine two 158s into a 3 Megabyte MP running under MVS, with a considerable improvement in reliability.

"We now make just one, scheduled, IPL a week. Though this in part due to the greater reliability of the 3033 on which we now run, our post implementation review while still on the 158s showed considerable savings.

"These included a saving of 100 machine hours/year for quicker scheduled IPLs, and 400 man hours/year because of no partition redefinition. These were directly attributable to MVS.

"We also benefited from a throughput improvement of around 10 per cent."

Surprises for the unwary

EMPHASISING that MVS is in some respects radically different from its predecessors, the conference brought to light a number of interesting features which could surprise the unwary.

- ● From 1.2 milliseconds on a 158 under MFT, CPU time per I/O rose to about 4.2 milliseconds under MVS. On a 168, EXCP time rose equivalently to 1.5 milliseconds. All measurements were made in the absence of paging.
- ● If a double-buffered ISAM or other file is converted without change to VSAM, the first buffer is used for VSAM itself. This can lead to a significant decrease in performance. Studies suggest that the best general guideline is to increase the number of buffers to 10 under MVS.
- ● IMS performs worse on a multiprocessor under MVS than on a uniprocessor. Installations are therefore tending to run IMS and CICS applications on a separate MVS machine.
- ● Most commonly encountered program conversion problem is in moving records from I/O areas to work areas. Where variable length records are involved and the maximum length is currently moved, an exception will be generated under MVS because of its different buffer allocation. In general, if you cheated before and got away with it, you will be caught under MVS.
- ● If a medium-loaded non-MVS system is converted to MVS, it will generally use more CPU but will get more work done. A heavily loaded VS1 system will often not get so much work done under MVS.
- ● MVS poses a number of problems for operators used to older OS system. For example, most operators believe that doubling the number of initiators will double the throughput. This is emphatically not the case with MVS, where swapping will in this case reduce performance considerably.

Changes on the way in the packaging and delivery of MVS

SIGNIFICANT changes appear imminent in the way in which MVS is both packaged and delivered.

With Release 3.8, the system will no longer be available in distribution library format, instead being supplied in discrete functional modules. It is also likely to be available in the IPO format, though this option has not yet been officially announced for 3.8.

IBM is also understood to have restructured its program product extensions to MVS. These will not now cut across functional boundaries, as for example the RACF SU did, touching all MVS functions.

As it has done with its other operating systems, notably DOS/VS, functional enhancements are likely in the future to be concentrated in chargeable extensions. One of the first manifestations of this is expected to be Release 2 or MVS/SE, which could contain a massive enhancement of MVS function.

CORAL NEWS

Coral News appears every quarter to provide users with up-to-date information, news and opinions. Items for inclusion should be sent to the Coral Press Co-ordinator. The National Computing Centre. Oxford Road, Manchester M1 7ED.

Standardisation:

A draft British Standard for CORAL 66 has been issued by BSI and is available at £1.50 from their office in 101 Pentonville Road, London N1 9ND. The standard incorporates comments made on the MOD Official Definition — the Blue Book. CORAL 66 has been accepted by ISO as a candidate for international standardisation and they are circulating the draft for international reactions.

MOD has now approved the GEC 4070 and 4082 machines which join the 4080 on their standard list. The approval includes the extended form of the GEC CORAL compiler.

CORAL 66 will undoubtedly feature strongly in an afternoon discussion meeting organised by IEE. The meeting on 21 May will examine Standardisation of high level real time industrial languages. Details from IEE at Savoy Place, London WC2.

Books:

Two books are published by NCC: John Webb's Coral Programming published at £5.00 and a course in CORAL 66 by Halliwell and Edward also at £5.00.

Training:

Courses in CORAL 66 are regularly offered by several organisations including John Bell, CEGB, Ferranti, GEC, NCC, Preston Polytechnic and SDL. NCC's Real Time Program Design course was developed for the CORAL 66 group and runs for 2 weeks starting 4 June.

Preston Polytechnic joins the increasing list of establishments providing CORAL training. Their course was developed in collaboration with British Aerospace, Aircraft Group, Walton Division and will run 23-27 April and 10-14 September.

MASCOT:

MASCOT — Modular Approach to System Construction, Operation and Test — is an integrated approach to design, implementation and testing of real time parallel processing software based on a form of modular decomposition.

Development is being controlled by a joint industry — MOD group with major work packages being undertaken by software houses including CAP, Software Sciences Limited and Systems Designers Ltd. SDL's new CORAL compiler for IBM 370 machines caters for MASCOT Programming for OS users.

CORAL 66 is helping to speed up passenger departures at airports around the world, through many of the computerised departure control systems. One of these systems is at busy Hong Kong Airport.

The system was installed by Scicon Consultancy International and Cable and Wireless, and is based on PDP-11/35 computers running under RSX11-M with DEC's CORAL 66 as the main application language.

Called LOPAC (Load Optimisation and Passenger Acceptance Control), the system handles all three stages of departure control — flight opening, passenger and baggage check-in, and close-out. The system also handles the weight, type and location of baggage, freight and mail loaded on the aircraft.

The flight opening stage entails the provision of basic information to the load controller such as flight number, route, scheduled departure time, crew, seat configuration, etc. Passenger reservation information is also provided to help the controller allocate seats for groups, individual reserved passengers and stand-by passengers. If the flight originated at another airport, the seating arrangement of the passengers in transit is received from up-line stations which allows the controller to determine which seats are available for passengers boarding at Hong Kong.

Faster passenger and baggage check-in procedures are made possible by the system pre-allocating seats for passengers on the reservation list (but retaining passenger seat selection if desired) and automatically calculating excess baggage charges. The system updates passenger and baggage weight totals as check-in progresses.

Close-out begins when the normal flight check-in desks are closed and if seats are still available, any stand-by passengers are accepted and checked-in.

After close-out, the system calculates final load and balance (weights of the crew, passengers, baggage, freight, mail and fuel) to ensure that the load limits are not exceeded and the weights are appropriately distributed for the particular aircraft in use. The system also produces a passenger manifest, a seating chart of where they are located and a no-show list.

The nerve centre of the system is the two PDP-11/35 computers which control, in parallel, all data fed into the system. At any given time, only one processor provides the output data and the other is ready for automatic standby.

Flying with Coral.

CORAL 66 has been used to prepare the operating software for a new Telecommunications Centre in Reading. The Centre has been opened by the Thames Water Authority to provide a radio network spanning the Authority's region which extends from Gloucester to the Thames Estuary — an area of 5,000 square miles. This is the first major telemetry system for river management and provides centralised computer communications to keep in balance up to 40 million gallons of water a day. The system is based on two ARGUS 700G computers and the total cost of the Centre was approximately £2 million.

The Post Office have ordered a GEC 4070 System for design investigation. The system will be used for the design aspects of The National Radio Paging system which will eventually provide a service for more than one and a half million customers. The operating system and the programme development aids will be written in CORAL 66.

A CORAL 66 compiler is included in the virtual languages available on Semaphore Computer Systems who are supplying the Vanguard 7800. The systems are based on the Varian series of mini computers and the capability includes real-time and multi tasking disc operation.

One hundred and thirty representatives of Swiss industry had an introduction to CORAL 66 on 15 March. A seminar was jointly organised by DEC and Brown-Boveri at the latter's Research Centre in Baden and included a speaker from MOD.

Programs in CORAL 66 are among those supported by a newly released package that provides logging, monitoring and recovery features.

The package Real Time Aid to Diagnosis (RADAR) developed by John Bell, Computer Services, is available in Germany and USA as well as the UK.

66 CORAL

PEOPLE AND EVENTS

By Judith Morris

Potts

Dryer

BIS directors appointed

BIS Applied Systems has appointed **David Dryer** and **Derek Potts** as associate directors. Potts has been manager of the company's training division since 1977, and Dryer has worked in the consultancy division where he has led the development of the company's management services. **Terry O'Connell**, manager of development division, is an executive director of the board, as is **Gerry Richings** who is manager of the Manchester office.

Walkerden to head British Olivetti

THE appointment has been announced of **Keith Walkerden** as managing director of British Olivetti, one of the largest subsidiaries in the Olivetti group. Walkerden is currently managing director of Olivetti Australia, and has been with the company for the past 16 years. He will be replaced by **Ike Honigstok**, who until now has been northern division manager, with responsibility for Queensland and the Northern Territory.

Throughout his career with the company Walkerden has held both sales and managerial positions, and in his new role will replace **N. Colangelo**, who is returning to his native Italy.

Liz Attewell has joined SMR Sales and Marketing Recruiters to set up a new company, SMR Technical Support People. She was formerly UK selection and appointments manager for Control Data Institute, the educational services division of Control Data.

Barry Foster has joined Digico's scientific and industrial sales team as a salesman for the East Midlands. He was formerly a salesman with IBM, having started his career as a field engineer with Burroughs. Previously general production manager for Digico, **Frank Gibbs** has become field service engineer for the company.

Jerry Thompson, who is chairman and founder of Shade Computer Services, has been appointed an industrial representative of the newly-formed BCPL user group committee. The committee was formed earlier this month at Cambridge university at the group's inaugural meeting.

Mike Taylor has become European technical support specialist with Digi-Data, with responsibility for sales, support and customer training. He was formerly with Ragan International as assistant engineering manager.

Bob Lamble, after working as service manager for Wright Air Conditioning for the past three years, has been appointed to the board by Wright Air Conditioning (Scotland).

Paul Keane has been elected to the newly-created position of executive vice-president of Penril. He was previously vice-president and prior to that chief financial officer.

Activities including a sponsored radio show by students at the University of Kent at Canterbury have raised money towards computer equipment for a blind student. Six student disc jockeys were sponsored to work 12 hours each as part of a marathon 72-hour recorded programme. Other events included auctions and competitions. Seen here is Kairen Evans presenting a cheque for the amount raised to Professor G. Martin, deputy vice-chancellor of the university and chairman of the computer committee.

Ed Cooper has been appointed field sales manager of Livingston Hire. This promotion comes six months after Cooper joined the company as a salesman. Previously a sales office manager, **Mike Collins** has been appointed sales manager of Livingston Hire.

Andras Csaplar has become Gaelic applications manager for the US subsidiary of Compeda. He joins the company from Monolithic Memories where he was mask design manager, and in his new position will be based in San Francisco.

John Couch has become vice-president, software, for Apple Computer. He was formerly new products manager. In his new position he will have responsibility for all systems and applications of software development.

Peter Atkins has joined Arbat (UK) as project leader. He was previously senior computer auditor at Barclays Bank.

Neil Chalmers has joined Computer Machinery Company as territory manager for Tyneside, Teesside and Humberside. He was previously a salesman with NCR.

Charles Johnson has joined Priam as vice-president of operations. Before joining the company he was vice-president of manufacturing for Diablo Systems.

George Eaglesham is retiring from Design Office Consortium where he has been financial controller of the CAD Centre. His place has been taken by Ted Mellish who has come to the centre from the DoI headquarters.

Keither New has become product manager with Moore Paragon, where he is to head the launch in April of their small computer supplies package. He was formerly account executive of small business machines for Moore Paragon South Africa.

THE impact of the microprocessor revolution was explained at a graduate conference given by Plessey Telecommunications. Some 170 new graduate trainees attended the conference, where they heard managing director Des Pitcher stress the importance of the development of young talent in a period of "exciting developments" in the telecommunications industry. Our picture shows some of the graduate recruits looking at an electronic unit during a tour of Plessey's Beeston site.

DIARY

APRIL 18
Specialised DBMS techniques. T O'Brian. BCS Specialist group. University College, London WC1.
Micros in action. BCS and Amateur Computing Club. NCC, Manchester. 18.30.

APRIL 18-19
Which word processor, and seminar. Infotech. Regent Centre Hotel, London W1. 9.30

APRIL 19
Trade union perspectives. Ian Benson. BCS London branch. Waldorf Hotel, London WC2. 18.00.
Marconi systems, an appraisal of current developments. BCS. Stoke Hotel, Guildford. 19.30.
The new information media. BCS South Essex branch. West Cliff Hotel, Westcliff-on-sea. 19.45.

APRIL 20
Seven-a-side soccer and disco. BCS Belfast. Uprichard Park, Belfast. Details from W and F Heron, tel: Belfast 59415.

APRIL 23
Euronet. P. Kelly. BCS data communication specialist group. BCS headquarters, 13 Mansfield Street, London W1. 18.00.

APRIL 24
What next in the office? NCC. Cafe Royal, 68 Regent Street, London W1.
Microprocessors. T.G. Read. Pentewan Road Laboratories, English China Clay, St Austell. 19.30.
BCS Hampshire branch. Visit to Esso, Fawley. 18.00.
Planning for the 1981 census. BCS Local Government group. West Midlands County Council, 1 Lancaster Circus, Birmingham. 14.00. Please notify secretary on 01-828 2333 if you wish to attend.

APRIL 24-26
IBM CUA annual forum. [illegible] Hotel, Bournemouth. 14.00.

APRIL 25
BCS Sussex branch. Visit to British Caledonian Airways, Gatwick Airport, London. 14.30.
Interactive computing. Study Group, Computers in Survey Analysis. Manchester Polytechnic, Manchester.
Microprocessor—man to consequence? BCS North Staffordshire branch. Prof. Laver. Clayton Lodge Hotel, Newcastle-under-Lyme. 20.00.
Data protection legislation. BCS Edinburgh branch. Heriot-Watt university, Edinburgh. 18.00.

APRIL 26
Computer aided drafting and the drawing office of the 1980's. IMechE computing techniques section. 1 Birdcage Walk, London SW1. 14.30.
Lecture and demonstration. BCS North Wilts branch. PYE TMC Malmesbury. 20.00.
The significance of computing. BCS South West branch. Wonford Hospital, Barrack Road, Exeter. 19.00.
Installation visit, to JW Windows. BCS South Wales branch. Curran Road, Cardiff. 19.00.
Computerised hospital outpatient projects. BCS Medical (Scotland) specialist group. Southern General Hospital, Glasgow. 11.00.

Liveware Saga by Don

Reader's complaint inspires package

ICL is taking advantage of a Philips user's discontent to develop standard software for the motor parts business. The user, SMG Motor Factors of Stourbridge, Worcs, desperately needs a bigger system to handle its stock control operation and ICL has offered to supply SMG with a complete system for £20,000, charging nothing for the software.

SMG, a first-time user, complained to Computer Weekly earlier this year that the Informer VRC sold to it by Philips Data Systems was not nearly powerful enough to handle the volume of stock updating involved in its business (CW, March 1).

Philips offered to part exchange the Informer for a much more powerful disc-based P410 system, but Philips costed the 410 system at £36,000—about £20,000 for the hardware plus £16,000 for the software.

An SMG spokesman told Computer Weekly, "ICL is writing all the applications software for us and plans to offer it to other motor factors as a package. The ICL machines will be installed in three or four weeks."

Philips told CW that it would help SMG find a buyer for the Informer and guaranteed to provide the Informer's new owner with full hardware and software support.

W. German authorities flout data laws

DESPITE West Germany's Data Protection Act, and similar Acts in several separate states, many national and local government authorities are still selling name and address lists on a large scale, according to the Federal data protection commissioner, Hans Peter Bull.

Sometimes these sales comply with the Act, but often they do not, according to Bull. Apparently local authorities in particular do a brisk business in selling details of marriages, births, school-leavers and the like to mailing list firms, banks, and similar agencies. The driver and vehicle licensing centre in Flensburg apparently earns between £500,000 and £750,000 a year selling registration data.

One sale that Bull has censured was the passing of a newsletter mailing list from the Economic Cooperation Ministry to the Protestant Church in Bavaria, which wanted to send out a questionnaire. The list contained information on Church and trade union affiliation, and so its sale was in fact a breach of the Act.

The Act forbids the passing on of a name and address without the subject's permission, but according to Frank Koch, a Bavarian lawyer, many banks and insurance companies include a provision in the small print of their contracts which constitutes this permission being given. Thus, he says, the Act "is transformed into a useless scrap of paper".

The Directory and Direct Advertising Association operates on a voluntary basis, what is called the "Robinson Crusoe List" on which people can ask to be put if they want to be taken off advertisers' mailing files.

Blow to women's equality

THE potential impact of the introduction of the microprocessor "could seriously set back the progress that women have made towards equality of opportunity." This was the claim of an official of the clerical union APEX.

North West area secretary Peter Scott, talking at a joint BCS and NCC discussion on the micro revolution, said that women's equality would take a step back because the major employers of female labour, banking, insurance and distribution, would be "absolutely devastated by the introduction of the microprocessor."

He told an audience of 200 that society would have to change to cope with the situation.

Compec Europe tickets

DON'T forget to send for your entrance ticket to Compec Europe, the annual computer peripherals exhibition to be held in Brussels from May 8-10, and the largest show in the series.

Tickets are available from Room 821, Iliffe Promotions, Dorset House, Stamford Street, London SE1 9LU, tel 01-261 8437.

Scanners for China

A CONTRACT for the first general-purpose CAT scanners to be sold to China has been signed by EMI. The equipment, destined for the Cancer Institute of Peking, consists of two whole-body scanners, a 7020 and a 7070, and an Emiplan 7000 radiation therapy treatment planning unit.

University link-up

THE two Control Data 7600s at Manchester University have now been linked, forming what is claimed to be the first multi-mainframe 7600 production system in the world. The special software required has been developed jointly by Manchester computing staff and Control Data. The link allows files resident on one machine to be accessed by users on the other.

Civil servants' dispute

● From front page

mally paid through that computer."

A more recent victim of the escalation is the Customs and Excise cargo section at Heathrow Airport, which has been subject to partial strike action for almost two months.

"The Customs and Excise people were having trouble with the Laces online import clearance system at Heathrow due to the enormous amount of freight being held up there," said a spokesman for the Civil and Public Servants Association. "There was an attempt to get around the problem by adding extra disc capacity, but we pulled out about 90 of our members in the department who were already working to rule."

The allegation that there were problems with the Laces system was denied by a Customs and Excise spokesman, however, who said that it was working properly. The only problem was in the clearance period.

"Normally, it only takes about 24 hours to clear freight from the warehouse," he said, "but it is now taking up to six days."

As an added precaution against the future use of other staff to cover for the CPSA members, the union is working towards an agreement with the Transport and General Workers Union leader, Moss Evans.

Over the Easter week-end, air traffic controllers at Heathrow will be joining in the dispute and long delays on holiday flights are expected.

Two young visitors inspect a Honeywell Level 6 minicomputer at the Careers for the 1980's — Scotland exhibition, held at the Kelvin Hall, Glasgow. At the Honeywell stand, those looking for a job could enter their qualifications into the computer, which then displayed appropriate job descriptions and vacancies at Honeywell's factories in Newhouse and Uddingston. Some 48,500 visitors attended the exhibition which was officially opened by the Minister for State at the Scottish Office, Gregor Mackenzie.

Indian govt order goes to CDC

THE central mainframe for India's ambitious national informatics centre is to be a Control Data Cyber 172.

Funded by the United Nations development programme, the NIC is to be a hierarchical network of minicomputers and mini-based terminals serving all the major departments of the Indian Government (CW, November 2, 1978).

Finalists for the $2.7 million contract, which carries much prestige, were CDC, and Burroughs with a B7800.

It is understood that in benchmark tests Burroughs, using the earlier B7700, outperformed CDC, but that a final price reduction by the latter, coupled with delays in production of the B7800, tipped the scales in favour of the Cyber 172.

Govt chaos over 2970s

● From front page

running of systems under emulation.

Some of the original 1900 systems are still running under emulation on the 2970s, although most have now been converted to run under VME/B along with new systems.

Replying to the criticisms in the director of audit's report, the director of administration and management services pointed out that the review on which the report was based took place during the most troublesome period of changeover in July/August last year.

He admitted that getting the 2970 system to operate satisfactorily had been more difficult than expected and that the difficulties would have been more easily resolved if the 1900s had been kept as back-up after June last year when the changeover was made. But this would have cost $500,000 in rental.

He revealed that ICL had supplied 750K bytes of additional memory for the 2970s at no extra charge as part of its efforts to improve their performance.

MICRO NEWS

By Martin Banks

New bubble market with Bell technique

THOUGH some investment analysts remain sceptical about the rosy future that has been foreseen for bubble memories, the news that Bell Laboratories could be producing a single, 1 Mbit device (CW, March 29) within a year highlights the potential of this new technology once again.

The development team, led by the co-inventor of the technology, Andrew Bobeck, has found a way round some of the design and production problems that could have restricted its development. The memories Bell plans will be a third the size of those currently available, and have a data rate that is ten times faster.

Bobeck announced the development at a conference on magnetic bubbles in Palm Springs, California.

His team, Stuart Blank, Duane Butherus, Frank Clak and Walter Strauss, see the development extending the potential of the bubble memory beyond the market for replacing existing magnetic media, and into the telecommunications area. Bell Labs is already using bubble memories in some telecommunications applications, notably the 13A Announcement System. Here they are used to play back the "call-assist" messages.

The key to the increase in data rate and the reduction in device size is the development of a new method of moving the magnetic domains — bubbles — around the device. Current techniques require that the garnet material used to hold the bubbles is centred between a pair of coils. These generate a rotating magnetic field to move the bubbles.

Bell's new approach is to replace the coils with thin layers of either gold or aluminium. These layers have oval holes etched into them, and when a current is applied to them a magnetic field is created.

A major advantage of this new development is that the manufacturing process required is now compatible with semiconductor techniques, which could mean they will be cheaper to manufacture.

Disregarding for the moment the new applications for bubble memories, such as the telecommunications areas being exploited and examined currently by Bell, this latest development could well change the views of some sceptics about the future of the market.

Venture Development Corp, a specialist high technology investment company in Wallesley, Mass, has for example discounted many of the enthusiastic predictions about the bubble memory market, and has put a limit of 230 million dollars a year on its predictions for 1981 factory shipments of the device.

The basis of these predictions was the expense of using the devices as replacements for moving head disc memories, the resulting conclusion being that the major market would be in competition with fixed head systems only.

Bell apparently feels that such market estimates were eminently justifiable, before this new approach to bubble memory manufacture was developed. However, the possibility of much lower unit costs that the development heralds could change this view.

Wide range of systems to rent

EVEN though microcomputers have drastically reduced the cost of obtaining computing power, they can still represent a considerable investment for many purchasers, and the prospect of buyers making expensive mistakes in their choice of microcomputer system has attracted another company to start up a rental service for small systems.

This latest company is Microdigital, the Liverpool-based computer store, and its rental operation, Microdigital Hire, plans to have available a wide range of systems to choose from. These will include the Commodore Pet, Nascom 1, Exidy Sorcerer, Tandy TRS-80 and the Apple II. Prices for hiring these systems will range from £2 a day for a Nascom 1 to £10 a day for an Apple II with 48K bytes of memory.

A full range of peripheral systems are also planned to be available, as will a software library currently being developed.

Future developments will include the availability of North Star Horizon and Vector MZ systems through the hire company.

The new operation is to be managed by Mike Maughan, seen here with an Apple II and an Exidy Sorcerer.

● Microdigital is about to announce a new "high-level" language designed to run on a standard Nascom 1. Called MS, the language takes up 600 bytes of memory. It will cost £10 to buy, and will be given free with a purchased Nascom 1.

Help and advice from users' club surgeries

"DOCTOR, doctor, my computer's got spots before the eyes."

"Then stop using the light pen."

No? Maybe not, but it is the sort of corn that immediately springs to mind with the announcement of what basically seems to be a good idea.

Micus, the new microcomputer user club formed by the Institute of Data Processing Management, has decided to hold monthly surgeries for existing and potential users, at which three or four specialists will be on hand to give help and advice.

The first is planned for April 26, and will be held at 68 Oxford Street, London W1, between 4 and 6 pm. The second, in June, will be a surgery dedicated to advice and help for users of the Commodore Pet. Later in the summer, the club plans to hold a telephone surgery, a phone-in for people who cannot get to London.

The May surgery is being missed to make way for the annual meeting of the IDPM. Scheduled for May 23, the AGM will incorporate a conference on the subject of Micro Management.

To be held at the Bloomsbury Centre Hotel in London, it is expected to explore such topics as the impact of micros in traditional data processing, and some ideas of the office of the future.

Mixed-disc easier to use with CP/M change

A RELATIVELY simple modification to the popular CP/M operating system for microcomputers has been written by Abacus Computers, and allows the use of two different sizes of floppy disc drive in one system configuration. According to Abacus managing director Derek Rowe, this overcomes one of the few weak spots in an otherwise excellent operating system.

The advantage of the modification, Rowe says, is that mixed disc operations can now be employed with total transparency to the user. He feels this should be of particular interest to potential OEM systems builders.

The basis of the change is the addition of a second disc map table. The standard CP/M has one such table, which maps both the logical and physical sectors of just one size of floppy disc. The second table added by Abacus is held in the CBIOS section of the operating system — 512 bytes of user-definable operating commands.

When required, the second disc map is written into the system memory and utilised in the same way as the original map. Changes in disc size can therefore be accommodated while the system is running.

According to Rowe, the cost of the modified CP/M will be about half as much again as the standard system.

Two new models from AMI

GREATER integration of the systems functions on board the chip are provided on the new S6802 and S6808 microprocessors from AMI Microsystems. Both chips are object code compatible with the S6800 and can address up to 64K bytes of memory. Each incorporates clock circuitry, thus eliminating the need for the S6875 clock chip required with earlier microprocessors. The S6802 includes 128 bytes of RAM.

A BORING WASTE OF TIME, OR A WAY TO GET LATEST IDEAS?

What do you get out of a week at a conference?

By Nicholas Enticknap

Conferences are almost an industry on their own, as witnessed by the entries at the foot of this page. Nicholas Enticknap, *himself a regular "victim,"* takes a lighthearted swipe at the conference scene. He urges that they should be better planned and documented.

A CHANCE to sample the fleshpots of the big city? A refreshing break from the daily grind? A stimulating opportunity to gain a perspective on the latest ideas? Or a boring waste of time spent listening to self-opinionated nonentities who like hearing the sound of their own voices?

These are the sort of views you are likely to hear whenever the subject of conferences crops up. In general, they do serve a valuable function; at least, that is the verdict of many of our readers who tell us how they appreciate Computer Weekly's regular coverage of upcoming events (see below).

The trouble is that there are too many, all of them covering subjects of compelling interest. But the value to be derived from them is virtually impossible to measure.

They provide information, they give a perspective on a particular area of development, but they don't give you a nice quantifiable saving which can be duly gift-wrapped and presented to senior management for approval.

In some cases, obviously, the value can be taken for granted. If you are just about to acquire a small business system, it makes sense to go to a conference on how to buy a small business system. But justification is rarely as easy as that.

For those involved in high level strategic planning, it's part of the job to keep abreast of the latest developments, and conferences are a good way of doing so. But if your responsibility relates more to day-to-day corporate activity, two or three days away from the office is much more difficult to manage.

Apart from the question of acquiring needed information, there are other benefits to be gained from going to a conference. Simply getting out of the office can help you get a better sense of proportion about the installation's problems.

And the stimulus of meeting new people and considering issues which are not among your everyday concerns does freshen the mind and generate new enthusiasm.

This line of argument is exactly the same as the one most people would adopt to justify their annual holiday(s). But clearly the DPM cannot go off on holiday every week; equally clearly, he cannot go to every conference which might interest him.

So how do you decide which ones are really worth going to?

For most people, the answer is gut reaction. But on the off-chance that there might be a more scientific answer, we contacted one or two conference companies to see what they thought.

To put it briefly, they didn't. The established conference companies, such as Infotech and Online, follow the practice of issuing questionnaires to delegates at the end of each conference.

This does give them some kind of ideas about how well they have done, which speakers were good, and that kind of thing. But it's historical information, and not much use for making decisions about future events.

Nor does it tell you much about why people go to conferences — most of them say it's because they want information, which is not very illuminating.

Funnily enough, these responses tend to be rather uncritical about the subject matter; delegates usually reserve their venom for description of the venue and the catering, which suggests that the acquisition of information was not the only objective!

That conference organisers have difficulty in providing convincing reasons why people should go to their extravaganzas is shown up conspicuously in their publicity.

The word "conference" itself is virtually taboo — you are much more likely to read about a seminar, a forum, or, if they are really trying to impress, a symposium or colloquium.

The text is then sprinkled with puff-type expressions such as authoritative speakers, leading manufacturers, specially tailored for, of great interest and benefit to, all of which tell you nothing. And the wording in general borders on the meaningless.

Conferences can easily degenerate into mere chat-shows if they are not carefully thought out and properly structured. The subject should be clearly defined, and the various aspects to be tackled by the different speakers should be precisely delineated.

The speakers, too, are worth considering. It is sad but true that some people more or less make a living out of the conference circuit, skilfully disguising the same talk to cover a whole variety of different topics. Such people are usually entertaining speakers, but their familiarity with the subject under discussion varies from remote to non-existent.

These charlatans are betrayed in publicity material by a lack of detail in their CV. If they have any experience worth mentioning you can be sure the promotors won't be trying to hide it from you.

A final point to consider is the question of documentation. This is always a good indication of the quality of planning that has gone into the conference.

If proceedings, which include a write-up of what each speaker is going to say, are to be ready in time for the event, the organisers must start working several months in advance.

Good documentation also give the delegate a chance to concentrate on what the speakers are saying, rather than having to take notes. And it gives him something to show to his own manager when he gets back. It's always a good tactical move to have something positive to show for those few days spent out of the office.

CONFERENCES

THE INSTITUTION OF ELECTRICAL ENGINEERS is organising a major conference as a part of Communications 80, for the exchange of information and views on the latest trends and developments in communications technology. The aim is to highlight the user aspects of communications equipment and systems. It will take place at the Metropole Hotel, at the NEC, Birmingham, from April 15-18. Details from the Conference Department, IEE, Savoy Place, London WC2 0BL.

THE National Agricultural Centre near Kenilworth is the venue for the second Numerical Control Equipment exhibition and conference from April 22-24. On show will be the latest developments in the automatic control of machine tools for re-equipping the manufacturing industry. NC'79 is the second specialised event concerning the applications of numerical control and computer-aided manufacturing. It is sponsored by UK Commline magazine, and Numeridex. Details from Corinthian Exhibitions, 290 Brighton Road, South Croydon. Tel: 01-681 7055.

A WORKSHOP to increase awareness of how resources can be planned and controlled is to be run by BIS Applied Systems from April 23-25 at the Kensington Palace Hotel, London. Booking details from Jackie Collings: BIS Applied Systems, York House, 199 Westminster Bridge Road, London, SE1 7UT, Tel: 01-633 0866.

A TWO-DAY memory designer's seminar, organised by Intel, will be held at the Bafta International Centre, 195 Piccadilly, London, W1, from April 25-26. The seminar is intended to help engineers design better systems using available static, dynamic ROM and EPROM devices. Applications and details from the Seminar Registrar, Tel: Oxford 771431.

HEWLETT-PACKARD is to hold two one day seminars for engineers working on opto-electronic applications, at the National Computing Centre in Manchester on April 27 and the Royal Garden Hotel in London on April 30. Topics will cover fibre optics, optocouplers and optical scanning. Further details are available from Mavis Ballinger, Tel: 0734 784774.

COMPUTER fraud is the theme of a one day seminar to be held on May 3 designed to assist senior businessmen, their professional advisers and DP specialists on the risks of computer fraud and other security incidents. It will be held at the Royal Garden Hotel, Kensington High Street, London W8. It is organised by EIB of Oxford. Tel: 0865 512242.

THE Seillac II workshop on methodology of interaction will be held from May 7-10. This follows the Ifip workshop on methodology in computer graphics which took place in Seillac, France in 1976. The second workshop aims to solve some of the problems in understanding the psychological implications of interaction and defining the dimensions of interaction. Details may be obtained from Professor F.R.A. Hoppgood, Seillac II workshop, at the Rutherford Laboratory. Tel: 0235 21900 ext 372.

TMSA and TTS are sponsoring two separate two-day events. Managing software projects and software cost estimating will both be held in London on May 14-15, and in Geneva on May 17-18. For further information contact TMSA/TTS, TMSA software seminars, c/o State of the Art Ltd, Victoria House, Suite 501, Southampton Row, London, WC1B 4EJ. Tel: 01-404 4703.

BIS-DELTAK has chosen the theme of the impact of computers on productivity for its 1979 international training conference. Speakers will include Dr Rhodes Boyson, MP, Dr James Martin and Michael Jackson, who will discuss the implications of changes taking place in data processing systems technology and the increasing demand for skilled DP professionals. The conference will take place at the Sheraton Skyline Hotel, London Airport from May 21-23. For further details contact the Registrar BIS-Deltak, 17-23 Stamford Street, London SE1, Tel: 01-261 9760.

A WORKSHOP designed to assist librarians to exploit research findings has been organised by the Library and Information group. It is entitled Exploiting research: a LIRG workshop, and the speakers include J.M. Brittain, C. Harris, L. Mowat and E. Whalley. The workshop will take place from June 22-24 at Huntercombe Manor, Taplow, Berkshire, and details may be obtained from Alan Cooper, c/o Department of Library Studies, Loughborough University, Leicestershire. Tel: 0509 63171, ext 312.

MORE READERS REPLY TO RORY JOHNSTON IN THE PRIVACY DEBATE

Computers are not an exception to regulation

THE article by Rory Johnston (CW, March 8) ends with the old example from the introduction of motor cars when there was a law which required that each car had to be preceded by a man walking down the road carrying a red flag.

I have used that example for years in speeches, but I usually add: This rule was abolished because we got used to the car, which suddenly could go faster than the man.

For the moment, data protection legislation in various countries is one way to pilot the development of computerisation into a structure acceptable to the citizens. Some day these laws will probably be abolished. But what will we get instead? The "red flag" rule was replaced by some of the most extensive and often very bureaucratic legislation, when we realised that we later had to receive some extra bills, charging us the negative impacts of one in many ways positive technology.

Most of us, including those running computers at speeds faster than man ever could process information, accept society's demand for yearly car controls, rules about anti-pollution devices, licensing of drivers, speed limits, security equipment, limitations on vehicle size, penal codes for drunk drivers. Such legislation has become as natural to us as many other laws without which we cannot live.

Computers are not an exception to regulation. Looking into other sectors of technology, one finds much legislation to protect citizens or society. Let's face realities: We manufacture cars that can be driven faster than speed limits allow. Regulating other technologies is, however, not a reason by itself to regulate computers.

If Rory Johnston realises: that computerisation is changing the world; that computerisation has a tendency to marry other technologies, such as telecommunications; that such marriages have already meant a revolution, an information explosion; that development of computerisation is far from being at an end, not even at the beginning of the end — perhaps just at the end of the beginning; that man many times before has faced new ages, developing very slowly compared with today, but causing future shocks, and that many believe that society today cannot afford such shocks — then he would be happy that we now just have data protection laws. So am I, but I don't want to keep them in force longer than necessary.

JAN FREESE
Director-General
Datainspektionen
Stockholm, Sweden


Rory Johnston

Threat posed by centralised govt databases

HAVING studied Rory Johnston's further comments on the privacy issue (CW, March 22), I am not satisfied that he has adequately responded to points which I and others have raised. Since I believe that privacy is a serious and important subject I am very concerned that each argument and counter-argument should be treated in a scrupulous and thoughtful manner.

As I said in my earlier letter, I believe that the public's main worry about computers and privacy is "with the threat posed by centralised government databases and with the slow but steady move towards a quasi police state". Nothing that I have read, either in the Press generally or from what Johnston has said, has begun to convince me that this view is at all alarmist and that we should face the future with anything but pessimism.

Many of the arguments expressed about privacy seem to me to reveal an unbelievable degree of naiveté. A prime example is the oft-quoted notion that "if you are innocent then you have nothing to fear". This is a dangerous and stupid claim to make in a world where, in just the past 50 years, millions of innocent people have been exterminated merely because they belonged to a particular ethnic, religious or political group.

I find equally curious the notion that computers offer no serious threat to personal privacy, and that the same problems will exist whether there are computers or not. As Johnston, apparently in agreement with this idea, says: "Hitler managed perfectly well without computers". However, one could similarly add that Hitler also managed perfectly well without nuclear weapons, but this would surely not then lead us to the absurd conclusion that we have nothing to fear from nuclear weapons.

Information gives people the power to do things. With the information-handling capability of the computer this power can (and will) be enormously increased. The power will be used in the future both to benefit the individual and society and also to invade privacy and exert control over people's lives. What kind of a society we shall eventually create for ourselves remains to be seen. The present trends are not encouraging.

JOHN WELFORD
Musselburgh,
Midlothian.

The law already protects data

RORY JOHNSTON's article Data Protection Laws — the Real Threat (CW, March 8) cannot be allowed to pass without comment.

Firstly, the more general law does now protect data. Dishonestly to copy, erase or alter data in a system is probably an offence against the Theft Act 1968; the civil law of copyright, patent and (as Johnston himself points out) defamation, all have applications in the computing world. The arguments advanced by Johnston apply equally to these fields, yet no one suggests that these laws are unworkable.

Secondly, a clear statement of law imposing standards and duties on those concerned with data processing will command the natural obedience of the vast majority. Practices that are now tolerated will be seen to be wrong and will be eschewed — unless the proportion of dishonest individuals is higher in the computing world than elsewhere. There are many areas of life where inspectors have the right to examine the way in which work is carried on, from weights and measures to factories — and most are backed by criminal sanctions. People co-operate because the law imposes the duty upon them.

Finally, while the dishonest operator, programmer or system analyst may ultimately defeat any system, there are hardware, software and managerial techniques available to make the task very difficult. These techniques are flexible, and, properly applied, so improve the efficiency and security of the system that they are cost effective.

France, Germany, Sweden and Norway in Europe all have data protection laws, with (under one name of another) data protection authorities. The laws are backed by criminal sanctions, which are sometimes severe — in France from next January fines of up to 2,000,000 francs and/or one- to 5-year jail sentences come into effect. These laws restrict the flow of data to countries where there is no comparable protection. Were this country to stand aloof we would not be a data haven but a data desert.

M. HELY
Plessey Telecommunications Research Ltd
Stoke Poges, Berks

Rory Johnston replies

MR FREESE and I differ on a basic issue of principle. He stated his philosophy thus at a conference on cross-border data flow (CW, December 14, 1978): "You must regulate the free flow of data so it will flow free."

I disagree fundamentally. Regulations in this case can only hinder communication; we are not dealing here with motor cars that get into traffic jams. Governments all over the world are moving towards the imposition of controls on their media and information sources, and I and many others, including Lord McGregor (CW, March 29) think this threat to free speech is very sinister.

Citing other aspects of technology that are regulated is no argument for regulating computers, since for every machine that is regulated there are several others that are not. Motor cars only have to be registered when on the public highway, not when driving on your own property. Washing machines do not have to be registered. Duplicating machines are not controlled. Because they pose no threat?

Ah, but they do pose a threat. And in many countries they are regulated. In the USSR it is illegal to simply own a duplicating machine, simply because with it you can cause untold harm. You can defame people; you can undermine the confidence of the public in the well-intentioned efforts of the government to establish a just and equal society.

It took us centuries to establish once and for all that such controls form the roots of tyranny and are incompatible with a free society. Such harm as can be caused can only be dealt with justly by legal remedies after the fact, and this is done.

Of course computerisation is inflicting shocks on society. These shocks, however, are on employment, on our working methods, on education, on our social structure, on our world view, none of which [illegible] under the [illegible] of a Data Protection Authority.

College with 100% record on jobs

I WAS interested to read the article on the NCC Threshold course, and in particular to read of the "DP manager, who asked that his name be withheld" and who "was very disappointed" at the generality and superficiality of the course (CW, February 22).

Nobody has ever claimed that the Threshold course can turn tyros into fully competent and experienced programmers or operators overnight; what it does do is first of all to find those who can benefit from the training provided and who possess a proven aptitude for DP work and then provide a fairly broad basis for their future career, and in particular to provide specific training for operations and programming.

It is clear that the majority of other DP managers in this area would not agree with the anonymous speaker, for the students from this college following the same course are proving very successful in gaining employment and in fact every one of the 21 students who left us in August 1978 gained DP job . . . a 100 per cent record not easy to equal anywhere.

Follow-up of our other Threshold students over the past two years has revealed that all are proving to be better than average and that employers are very pleased with the progress being made.

If any local DP manager would like to visit us at Dudley and meet staff and Threshold students he will be made very welcome, whether he is just curious as to the pattern of training or the potential available, whether he is looking for trainee/junior staff or whether he is prepared to help by providing the relevant works experience aspect of the course.

I would like to think that the "anonymous DP manager" would accept this offer.

B.A.S. PATTERSON
Deputy Head
Department of Mathematics and Computing
Dudley Technical College

THE EDITOR welcomes letters commenting on subjects published in Computer Weekly, or on original topics. All letters must be accompanied by the writer's name and address, not necessarily for publication.

LETTERS

To: The Editor, Computer Weekly,
Dorset House, Stamford Street, London SE1 9LU

A collar and tie policy for ops

I WAS intrigued by the item on operators' clothes and mode of dress (Op Spot, March 22, 1979). I agree wholeheartedly with Bernard Allen when he states that this matter is not trivial or too unimportant to warrant the interest of operators.

Standards must be maintained, no matter how high those standards may be. My installation, Lloyds Bank Registrar's, Durrington, insists on a "collar and tie" policy 24 hours a day. The operators accept this policy and after a while it becomes normal. The bank does, however, provide each operator with two white dust jackets free of charge and replaces them every 4-5 years! Unfortunately, the jackets are not made to a very high standard and tend to fall to pieces after 3-4 years! They do protect the operators from various sources of contamination, such as ink from print ribbons which could quite easily soil normal clothes.

I think that as our employers are generous enough to give us jackets to protect our clothes, the least that we can do in return is to wear garments suitable to our "banking" image. Which means collar and tie, but no jeans.

The standard of output from this installation is of the highest quality (of necessity) and it is my belief that this stems from the fact that the bank demands high standards for everything from an operator's mode of dress to a certificate of share holding for a member of the public.

If you want to check my last statement about Lloyds Bank's high standard then I suggest that you have a look at any statement or certificate issued from one of the computer centres belonging to Lloyds and compare it with one of those very nice letters from Ernie. Her Majesty's Services' computer output leaves a lot to be desired.

Having a letter from Ernie the other day containing some Premium Bond winnings, I was absolutely amazed at the "wavy line" printing. I would imagine that the operators who produced that document don't hold with the collar and tie idea.

BARRY DENYER,
Operator,
Lloyd's Bank
Registrar's Dept.,
Worthing.

Spare his blushes

WE recently advertised in Computer Weekly for six cheap VDUs, giving our telephone number as contact. We were pleased with the response and did a deal with a bank in London for no less than 10. Unfortunately, I did not record the telephone number of the gentleman concerned and I am now in the embarrassing position of having bought 10 VDUs from someone I can't contact!

Can anybody help to make my red face return to its normal complexion?

J. S. McKENZIE
Managing Director
Manx Computer Bureau,
Isle of Man.

Crime and ethics

● From page 4

wrong with manipulating a computer program for personal gain.

In the second place it is worrying that juries betray such unconcern over their activities.

Witness the young man who used a Pacific Telephone and Telegraph computer to siphon off $1 million worth of parts, which he then sold on the black market.

His sentence? Sixty days in jail. In fact he was released, for good behaviour, after a month.

For every such rogue locked out by encryption there could be 10 who would jump at the chance of a spot of quiet fraud in a technological environment where detection would be virtually impossible except by circumstantial evidence (a sudden jump in his standard of living, eg).

Imagine how big the Equity Funding bubble might have grown if encryption had been the order of the day. Offering cryptography to a computer user even a modicum less than 100% honourable is like giving him a blank cheque from the taxman.

It all comes back to my original point that powerful techniques to combat certain threatening forms of crime are available to us. But before we use them we must be absolutely certain of the implications of doing so. And no one is more aware of the implications than us in the computer industry.

Adler aims at first time users

A SYSTEM aimed at first-time users prepared to take on a VDU/floppy disc machine from the start rather than being weaned on magnetic ledger cards, has been introduced by Adler Business Systems. Called the TA 1100, it costs £9,500.

TA 1100 hardware includes a microprocessor based CPU with a 24K byte ROM for system software and 16K of user memory, twin floppy disc drives each holding 456K bytes, a VDU that shows 22 lines of 48 characters and a 20 chps golf ball printer with microprocessor optimised bi-directional printing.

Standard software packages offered with the TA 1100 cover applications like sales ledger accounting with invoice production and stock control, purchase and nominal ledger accounting with cash control, and payroll accounting for hourly, weekly or monthly pay.

The £9,500 price includes one software package of the user's choice and additional programs from the existing library are £500 each.

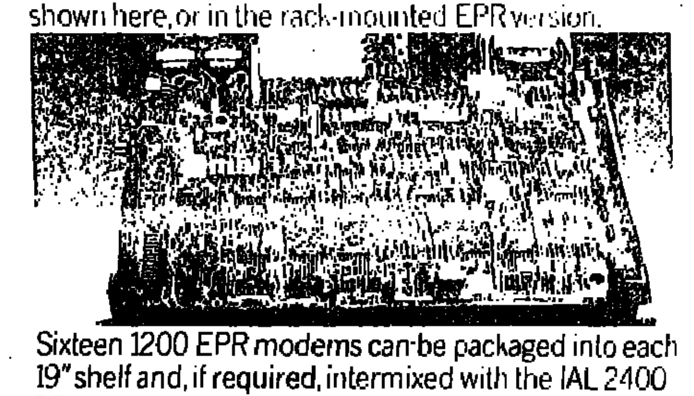
ABS says that the TA 1100 is aimed at firms with a turnover of up to £1 million and the company plans to demonstrate the system at private exhibitions to be held in May and June in London, Birmingham, Manchester, Leeds, Edinburgh and Glasgow.

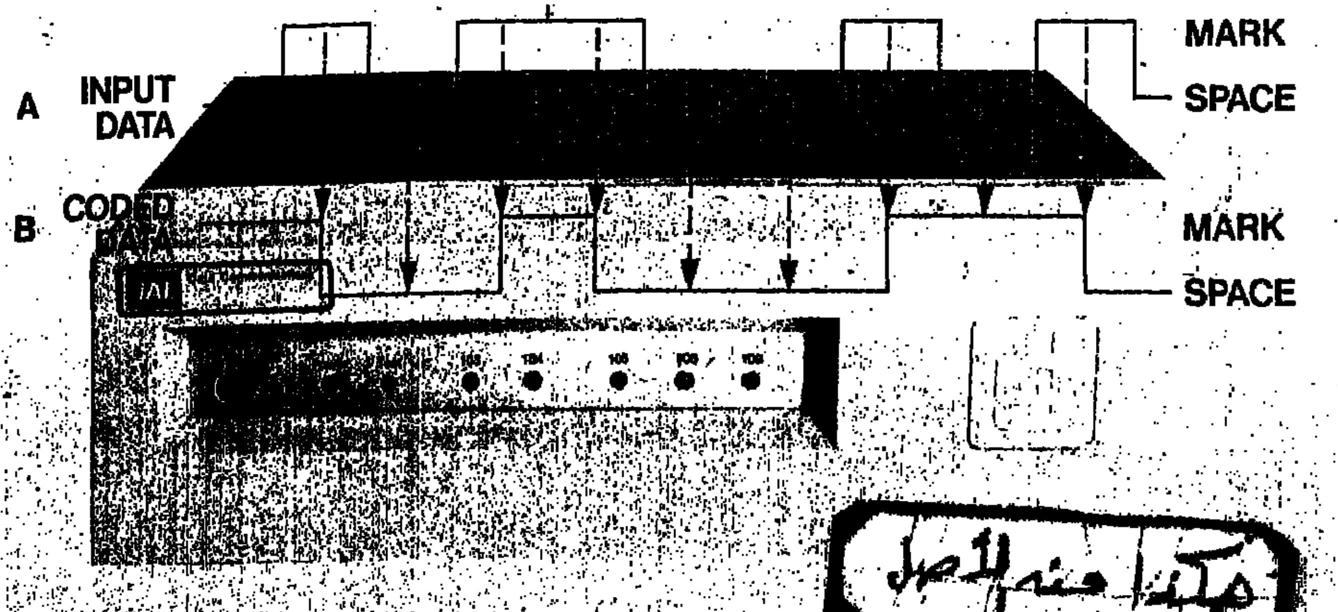
Lancs hospital adapts Argus for path lab work

THE Royal Lancaster Infirmary's pathology lab has acquired a Ferranti Argus 700 minicomputer which will cut out much of the clerical work involved in the production of medical reports.

The system accepts data produced by laboratory instruments, corrects for drift, performs mathematical correlation of a series of tests and produces reports, at the same time storing historical and statistical data on disc.

The suite of programs was originally developed at Hammersmith Hospital, West London, under the name of Phoenix. It was acquired by the North-West Regional Health Authority which modified it for running on its own Ferranti Argus minicomputer and gave it the name of Delphi-Phoenix.





French seek end to incompatibility

THE French Administration has proposed standards for videotex services based on the feeling that they will in future have to interwork with other services such as telex, teletex and facsimile, not to mention teletext which Bernard Marti, the author of the article on the French systems, refers to as "broadcast videotex".

Studies on broadcast videotex started in the CCETT, the Centre Commun d'Etudes de Television et Telecommunications, at Rennes, France, in late 1973, primarily because the UK teletext system was regarded as too closed and integrated to be readily adapted to French requirements.

The first stage of Antiope, the development of a modified television receiver, led to the implementation of a packet switched broadcasting network which was used to offer an experimental stock exchange information service in May 1977.

By August, CCETT was able to demonstrate an interactive system at the Berlin Radio Fair. The system was linked to a simple database on its timesharing service in Rennes by a leased line, via a terminal concentrator in Berlin.

As a result of this demonstration, a meeting was set up between the UK Post Office, the Bundespost and the CCETT teams to define possible standards for European videotex. A solution was produced which allowed compatibility at display level, and when this was amended in a CEPT meeting in March 1978 it was supported by six administrations excluding the UK, and it now forms the basis on which French manufacturers are working.

Antiope uses 16 bits per character, which enables colour and flashing to be set for each character independently, instead of by a separate control character, which creates a space on the screen where it is used. By using the microprocessor in the set, viewdata codes can be converted to the codes used by Antiope systems, the database Titan and the videotex service Teletel.

It is hoped that international standards will be agreed before French manufacturers go into production for the introduction of the public broadcast videotex service in 1980, as well as the trial service of interactive videotex for 3,000 users in Velizy near Paris. The manufacturers feel the deadline is this month or next.

Donald Kennett surveys viewdata/videotex

The race is on to set standards and reach mass market

FIRST in the field, Prestel is still in its infancy, but the international race is on: to set standards for electronic information systems of all kinds, to discover ways of integrating different systems, to stimulate mass production and the mass market.

The Post Office Prestel system has had 80 ports available for its test service since October last year, which it says is more than adequate for the number of terminals in the field, but at the same time it has discouraged organisations whose use of the system would be "excessive," such as the Stock Exchange, betting organisations and suppliers of coin-operated public terminals.

Coin terminal manufacturer Cherry Leisure's marketing manager, Richard Davies said it would not be worthwhile setting up production for fewer than 100 sets and the Post Office had limited it to six initially and 30 from the launch last month of the partial public service for domestic users in London only.

Set makers and rental organisations have commented that there is no point in mass producing sets until there is a public service for them to be used on, and that changes have been made since the test service launched that, for example, the Texas Instruments decoder module can only dial the one original telephone number allocated by the Post Office and this has proved to be the less reliable number of the two now available.

A catalytic effect on the market penetration of Prestel could come from foreign set makers who from September will be allowed to sell adapted sets for use with the service, so long as they meet the Post Office's safety and technical requirements. The UK set makers are not keen to lose the protection of their agreement with the Post Office which operates until then, but the alternative is that viewdata, the system which prompted the development of many other versions of videotex all over the world, may lose its lead and see another implementation clean up the world market.

VIEWDATA and other electronic information services seem poised to enter our lives on a large scale, but how much effect they have on us will depend on how cheap and how easy they are to use both for information providers and end users.

Cheapness and ease of use are needed to set up up a snowball effect in which greater use stimulates the provision of more information and other services, more enhancements to user equipment and yet cheaper products. Without this kind of interactive growth it is doubtful whether information provision can be profitable.

These considerations form part of the overview by Richard Clark of newly-formed information consultants Joan de Smith and Partners in a series of six articles in the April issue of Computer Communications* covering progress in several countries on viewdata, or videotex as the various versions are collectively known internationally. Clark sets the interactive narrowband videotex services in the context of the broader field of electronic publishing.

	Number	Growth
Prestel computers	2	About 20 during 1979
User ports (lines into computers)	84	4,000 during 1979
Information providing organisations	154	0 (waiting list about 70)
Information pages	95,500	3,500/week
Test users (including about 100 on PO and TV-company premises)	304	30-50/week

Table 1: Post Office viewdata statistics (UK)

The competition between systems is reflected in the competition between priorities in standardisation work. Ease of implementation vies with compatibility, both with existing data transmission standards and with likely future text transmission standards.

Canadian studies into high resolution graphics on videotex aim to provide interworking with facsimile systems, as well as better image display, whereas Australia, South Africa, Hong Kong and the USSR are all interested in simple systems.

Alongside the narrowband interactive videotex systems, Clark mentions the narrowband broadcast or teletext services, one of which is in Germany and confusingly known as Videotext with the extra "t". Other related categories are wideband broadcast and wideband interactive services. Outside the four categories other communications services on their own development path are expected to merge eventually and therefore must be taken into account as early as possible, but the details of the merging cannot yet be foreseen. These include telex and its enhanced future version for communicating word processors referred to, again confusingly, as teletex.

Wideband systems use extra carrying capacity either to broadcast something like 50,000 frames of information per channel (instead of about 100 on a narrowband system), or they can carry a full video signal that only has to be demodulated to go on the screen instead of being decoded as characters to be used in the generation of a video signal in the set. Examples include Qube in the US, Captain in Japan and Reuters Monitor.

Examples of narrowband broadcast teletext services include Ceefax and Oracle in the UK, Biblos in Belgium, Bildschirmzeitung and Videotext in West Germany, Text-TV in Sweden and Teletext in Denmark and Holland.

Problems which could cause setbacks to any of the videotex systems include potential responsibilities for defamatory or obscene material, discrimination against information providers, copyright issues and advertising standards. Present legal boundaries between broadcasters and publishers may have to be redefined, and regulation of message services may need some changes.

Canadian service aims at integration

THE proposed Canadian videotex service is now called Telidon, and its developers are working on it with an eye to the future. A major element of that future is seen as integration with future services and to this end they are catering for high resolution graphics, as well as aiming for independence of as many elements of the total system as possible, including the database access method, the communication medium and the terminal capabilities.

The future is also seen as bringing the possibility of videotex terminals which will generate graphic images, using the picture description instructions or PDIs now being experimented with, and manipulating them using picture manipulation instructions or PMIs such as rotate, scale down and transpose.

An image could be transmitted to another suitable terminal and the users, say an architect and his client, could manipulate the same image conversationally using joysticks or lightpens, with only the modifications passing between terminals as PMIs, instead of renewing the whole image each time.

Transmission of information in Telidon uses standard seven-bit code plus parity and the Shift Out control character defined in ISO 646 to change to graphics mode. It is designed to be compatible with existing business terminals and the emerging teletex international standards as well as videotex.

If a terminal cannot handle the graphics it receives it ignores them, but this does not prevent it receiving the text. If high resolution graphics are sent to a low resolution terminal it executes them as low resolution.

The PDI method requires a PDI processor in the terminal, but at current LSI prices it is claimed to be possible to build a reasonably advanced terminal within the buying power of the average consumer. As prices continue to fall, more powerful command sets will become economical and the design includes extension procedures to cater for this.

The method is also suitable for facsimile transmissions; resolution is typically to 12 bits, or 1 in 4,096, in a five-byte PDI operation code with data. This is variable.

Even with five bytes per instruction the PDI method can be more economic than the character method used in viewdata terminals.

A note on terms

IT is interesting to note that the authors of the article on Canada's proposed system say that the name videotex has been adopted internationally as a temporary generic name for public-accessed, interactive information-retrieval services which use domestic television receivers, suitably modified or supplemented, as terminal equipment. They do not exclude wideband interactive services, presumably because of their belief in the independence of the service from the transmission medium used.

Bernard Marti, writing on the French systems, refers to "broadcast videotex," whereas Richard Clark in his overview excludes both broadcast narrowband services called, in the UK at least, teletext and all wideband services.

Swedes test Nova based DataVision

THE Swedish test information service is based on a Data General Nova supplied to the Central Administration of Telecommunications as a turnkey system by the Swedish company AU System AB. The terminals for the 15 information providers have local editing capability and were developed by another Swedish company, Bejting.

The system, called DataVision, was initiated after discussions with the UK Post Office, but is being developed independently in several stages. After starting with a one-way information service, interactive working will be added, followed by alternatives to tree-searching and then a simple telegram service.

If these tests prove satisfactory, a market trial with about 1,000 users may be held next year or the year after. A full public service could then be introduced around 1983.

Field trial of a teletext service called Text,TV is scheduled for this year in the homes of 20 deaf people, to provide both subtitles to television programmes and full pages of text.

A special commission has been set up by the Swedish Government to investigate the full range of public information systems including still picture transmission, known in the US as a freeze-frame video, and also wideband applications.

Finns try out Telset

FINLAND has a test viewdata service called Telset with 1,000 frames and 30 users, the result of a co-operative venture by three companies which began in 1975, soon after details of the UK Post Office's work were published. Last year the system was modified to be compatible with Prestel and the test service began in June.

The system software runs on a Digital Equipment PDP-11 under RSX-11M V3, and while the domestic terminals are similar to Prestel sets, the business terminals are black and white VDUs with full Ascii keyboards and switch-selectable data rates from 75 to 9,600 bps.

The plan is to develop a system suitable for a town of 10,000 inhabitants, using 200 ports. This would then be duplicated in regional centres to form a nationwide service.

---

*Computer Communications Vol 1 No 2, April 1979. Published by IPC Science and Technology Press Limited, Westbury House, Bury Street, Guildford, Surrey 5AW.

Confident that a billion dollar income figure will be passed this year, PAUL ELY, Hewlett-Packard's computer systems division vice-president (right) talked to ROBIN WEBSTER about the company's philosophy and future plans.

Hewlett-Packard finds its role

FOR a computer company that, in the past, has had to overcome something of an identity crisis in terms of product range and market share, Hewlett-Packard has come a long way.

Describing the company as "low profile", Paul Ely, Hewlett-Packard's computer systems division vice-president understates the advances the company has already made, and is intending to make over the next few years, but that is because he too is part of that non-aggressive strategy.

"It is our expectation that we will be the next billion dollar computer company this year," he said confidently. "That is our stated goal, and our performance in the first four months gives us great courage that we will easily surpass that figure.

"The secret of growth for the last 18 months has been to have a very balanced programme. No single element has fuelled most of our progress."

Were there any plans to change this approach and rely on just a few products for revenue, or to carve out a large chunk of the market with a major *new product announcement*?

"No, I don't think so," replied Ely. "I feel that the kind of growth I am talking about cannot *be achieved* with one product. We expect to add a quarter of a million dollars to our computer business this year and you don't do that with one product—or maybe you do, but I don't want to bet on it.

"I would much rather do that kind of thing with four or five products, all of which are steaming along nicely. This kind of strategy allows us to continually upgrade our business in each of those product lines, which is a Hewlett-Packard trait. We don't want to surprise the market by making a major investment and then popping out the product to see what happens."

With that in mind, has Hewlett-Packard defined future product targets?

"Yes, I think we have," said Ely. "We feel the kind of products Hewlett-Packard has today represent a very promising area for us, and they are therefore something we should stick with as opposed to branching out into quite different areas.

"Several years ago, with the start-up of our HP3000 range, we saw fast growth in the business data and distributed data processing areas — *in fact it* represents an increasing share of our total business. On the other hand, the HP1000 has been gaining momentum too; very respectable growth rates are being achieved with that product."

At present, the company splits its computer systems division into two main areas, the technical and business computer families which provide $750 million annually.

"Technical products, which consist of both desk-top and technical minicomputers, account for about 50% of our total computer business, while the data processing line gives us about one-third of our business," said Ely.

Did Hewlett-Packard's strategy go as far as mounting an attack on its main competitor Digital Equipment, in a bid to gain the number one minicomputer manufacturer position, or was the expected promotion to the Billion Dollar Computer Company Club indicative of a more careful reasoning?

"In a sense we want to be number one," said Ely, "but the sense in which we would like to be number one is not the conventional one.

"It probably won't happen because we grow to be larger than, say, IBM...that is an unlikely event," he continued with a smile. "I'm not sure that it is even a good strategy for us to state or think of a goal like outgrowing DEC. It is already twice our size as a computer company and has a strong management and a proven record of growth. I think we can be number one in the eyes of certain kinds of customers instead; I think we already are in a number of areas.

"If somebody is thinking of business computers, products like the HP 3000 have the reputation required...with our desk-top range we clearly have a leadership position. In the middle of the technical market, while we have a position of *strength with the HP1000, in* trying to broaden that we *do* come up against DEC quite strongly. Some people would define being first as total measurement of market share, but we think that markets are defined in some peculiar ways."

Any company wishing to advance must consider the symbiotic relationship of hardware and software carefully but to these Hewlett-Packard adds a third factor—the user. So a "triangle", a carefully balanced system involving all three, is employed.

"Today, when things like the shortage of trained software staff limit user applications, we are trying to make it easier for the customer by making a big investment aimed at simplifying the operation of our computers. You no longer need special skills, you only need to know your company's problem and an afternoon to learn how to use this very powerful tool.

"Making the investment once, we save thousands of customers from making an equivalent investment individually."

Is this where the microprocessor has forced some changes in company attitude?

"Well, no, not really, and it just depends on your view. My view is that the microprocessor is just one more step in a logical sequence *of evolution* that was going on a long time before the micro and which will continue on beyond it. Certainly from an application point of view, the availability of the micro might make quite a change in what we can do, but I don't think it has changed our concept of computers. They don't look a lot different, it is our peripherals that have been affected mainly. There is now more power in our I/O equipment, and a lot more flexibility compared to the bunch of hard-wired logic we used to have."

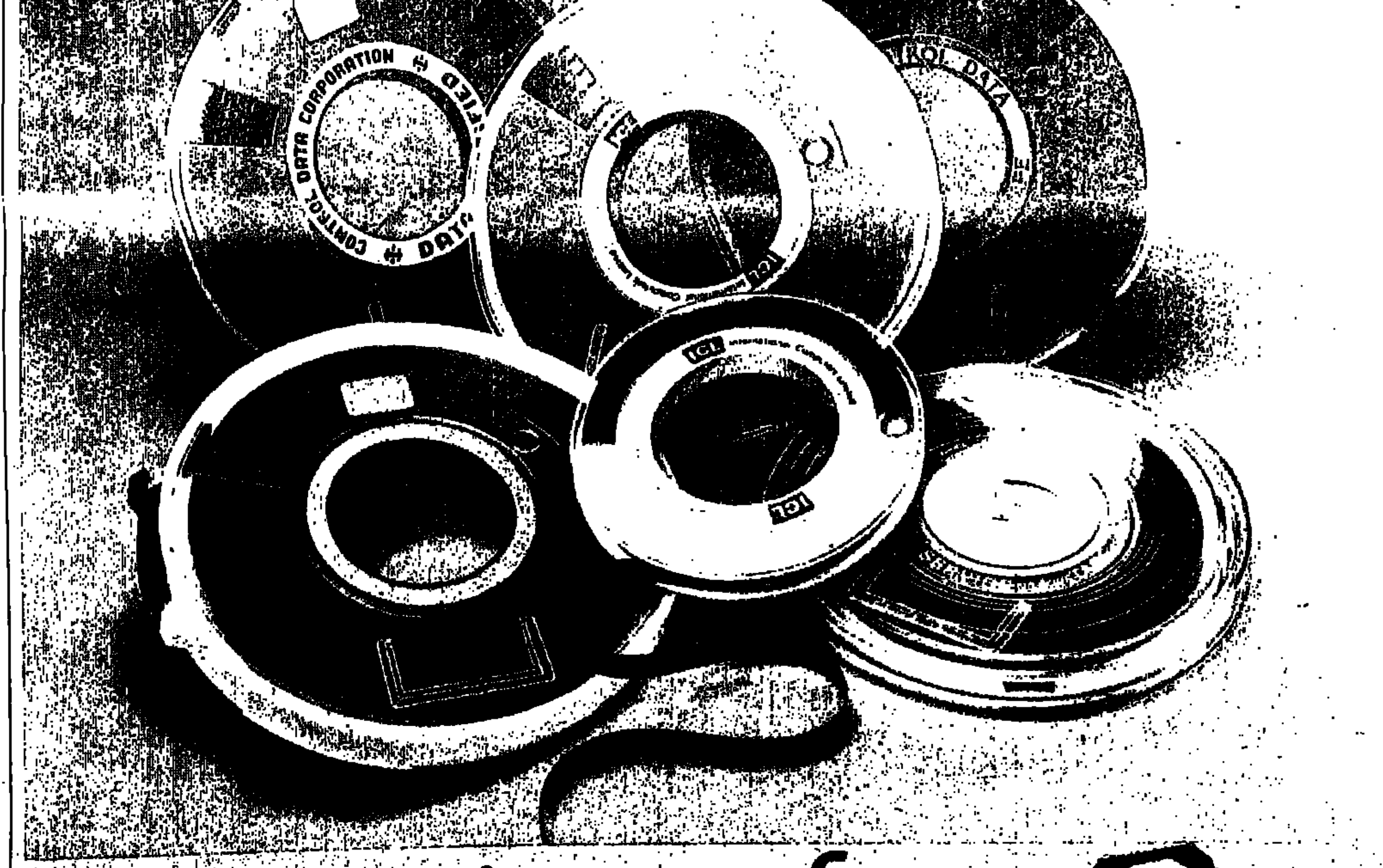
In Cupertino, California, Hewlett-Packard has its Silicon-on-Sapphire production facility (CW, September 7, 1978) where circuits for internal company use are manufactured. Had the idea of producing the same chips for outside use been considered?

"Well, it's a possibility that remains open," he said. "Today we feel that for two reasons it would not be a good choice. We think that we have a proprietary advantage in the process technology and therefore see no reason to give our competitors the opportunity to use it. It would also be wrong of us to limit our production facility to any particular circuit. The hardware alters so rapidly that if we did that, we would be producing out of date technology."

Recent desk-top computer introductions like the HP 45 are doing very well: has this success raised the idea of a "home computer" product line?

"If you look at some of our hand-held and desk-top calculators, they are frequently used as small business systems. The kind of thing you can get in the US for about $600 is not really useable in that way. You have to get more memory, which costs about another $1,000, then you need a printing device. If you want to run it quickly you have to get floppy discs...So by the time you have finished, you have spent several thousand dollars.

"I imagine what will happen is that in three or four years' time, we could make a HP35 available at a third of the price it sells for now. We have no real aspirations to go after the home computer market at present."



OP SPOT

By Bernard Allen

Everybody benefits from the open shop system

IT'S rather unusual for operations and programming staff to work in the same area, but they used to do so at an installation where I was once employed as an operator.

We ran an open shop system for development work. From the start of the day shift until about 4.30 pm, one of the systems was dedicated solely to testing.

The programmers were allowed into the printer room where they had access to card punch, card reader and VDU, so that they could feed their work to the system and monitor its progress.

It was up to the operators to take the output from the printers, split it up and hand it to the programmers.

The system worked extremely well — there was little bickering between members of the two departments, and each gained from the presence of the other.

The programmers got a quick turnround of work and were able to call upon the expertise of the senior operators when they came up against job control language problems.

We operators liked the set-up because we were able to prepare and run our own jobs, using the facilities present. Needless to say we weren't supposed to do so.

And when you work a 12-hour shift system, as we did at that particular installation, you tend to get a bit bored with each other's company. So talking to the programmers made a rather pleasant change.

As I have already mentioned, the open shop testing was scheduled to close at 4.30 pm every day in order to make way for live work. It was difficult to do this as there was one person who always insisted on having "one more shot."

Curiously enough, he was not a programmer but one of the members of a technical support group — a person who had come up through operations and therefore could appreciate the need to keep to the work schedule.

A particularly niggly little character, he would complain constantly to the trainees about both print quality and the line-up of stationery. Until, that is, one of my colleagues had a quiet word with him, pointing out the error of his ways. After that, he was fine, no trouble.

Anyway, I would like to hear your views on communication between operators and programmers. What does each have to offer the other?

Union asks for eye tests

THE National Union of Bank Employees has asked the National Westminster Bank to give regular eye tests to all its staff involved in the operation of visual display units.

NUBE made the request following reports that several of the bank's employees had experienced headaches and difficulty in reading newsprint after using the units.

Struggle for life of the BCS Specialist Group

THE operations specialist group of the British Computer Society is not dead, just dormant.

Despite the fact that the group has not met since last May, it is still "very much alive", according to chairman Barry Patman.

An operations specialist with Infotech, he told me, "The reason we haven't been meeting is that we have had a lot of organisational type problems."

Since last May, several of the group's committee members have changed their jobs, and secretary Peter Davis has resigned.

Said Patman, "We have had a lot of trouble finding a replacement for Peter Davis. We are still looking."

They want someone who can give up a "considerable" amount of time to the work, is able to communicate with staff at all levels, and has access to secretarial facilities.

He continued, "A couple of our members have offered to take the job, but they both work outside London. Ideally, we want someone near the Polytechnic of Central London, where we hold our meetings."

In his view, the group is important because it gives operations staff the chance to meet and discuss their work, and is "the only one" of its kind.

He continued, "In the course of my work, I get a lot of inquiries from staff who are interested in learning more about the group.

"We are looking to establish something which will represent operations staff of all levels. We don't want it to consist of managers only."

He is involved in the process of sending out a newsletter to members of the group to keep them informed about the situation and ask for their opinions on the subject matter of future meetings.

● Sadly, I must report that Opcomm, the Coventry-based operations group, has finally folded up.

After a bright start in February last year, the group had difficulty in attracting new members and as a result lost its momentum.

Apparently, pressure of work and the demands of working shifts prevented many of its members from attending group meetings on a regular basis.

The group carried out a number of projects, including a survey, commissioned by Computer Weekly, into the computer room environment. That involved contacting over 40 installations in and around the Coventry area.

In addition, many of its members were deeply concerned about the lack of training available for many operators, and were involved in drawing up a report on the subject.

A routine for program library reorganisation

A DISC program library reorganisation package which in live operation has cut run time from 40 minutes to one minute, is being marketed by CHC Software of Reading. Called ZLIB, it is intended for use on ICL 1900s and on 2903/4, and 2950s, 60s and 70s running under DME.

Tony Etherington, operations manager at a Department of Health and Social Security site in London, told me, "As an operations manager at a 2903/4 site I was very interested in the claims made for this routine and so we took it on a trial basis. I found it reduced our program library reorganisation time to one minute — it took 40 minutes using the standard ICL routine, XPEC."

According to Etherington, the routine also has a facility for permanently changing program priorities, which is especially useful for bootstrap loader routines.

He also says the listing produced by ZLIB is superior because it goes across the page and duplicate programs are highlighted.

HINT OF THE WEEK

Paper de-leafing

UP goes the printer lid and paper spews out across the floor — it's a paper wreck. Not a pretty sight, particularly at the end of a long eight-hour shift.

The unfortunate operator tending the unit must pick up the paper from the floor — folding it neatly, of course — sort out the inevitable mess at the back of the printer, re-align the stationery, and instruct the system to re-print the "lost" output.

Paper wrecks can be caused by faults in the device, or by poor operating such as setting the stacker incorrectly or failing to clear the output often enough.

But when two- or three-part listing is involved, wrecks may be the result of the paper coming apart, or de-leafing as it is known. When this happens, it tends to get caught up in the stacker rollers.

So each time you open a new box of stationery check that the paper is in good condition. If it is not, mark it as unusable and inform your operations manager or whoever is responsible for buying it.

Op Spot accused of bias

A NUMBER of you have said that this column tends to favour IBM kit

system. It's as simple as that.

But I have nothing against

Operators often complain that nobody listens to their point of view. Well, Op Spot is listening and Bernard Allen would like to hear you opinions and ideas on all matters relating to computer operations.

Your letters should be sent to Op Spot, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU. Telephone calls are equally welcome and Bernard can be contacted directly on 01-261 8035.

Electronic mail surveillance warning

THE prospect of a severely regulated environment hanging over the future of electronic mail is getting increasingly serious, according to Russell Pipe, a US commentator on communications and law.

Speaking to an ISL conference, From Facsimile to Electronic Mail, Pipe cited a large number of national governments that are considering control of information crossing their borders, for purposes of taxation and national sovereignty as well as privacy.

Many national authorities, Pipe said, are turning from the long-held principle of free and open communication towards the monitoring of electronic messages crossing frontiers. This leads to much uncertainty about how electronic mail can develop, particularly in the minds of those in international companies who are thinking of introducing it to improve their corporate communications.

Blocking of business information transferring even within a company is a "handy new practice", according to Pipe. He quoted Swedish leaders as saying "The critical mass of Swedish political, economic, and social data should not leave the territory."

Countries are also considering imposing import duties based on the value of the content of information, rather than the medium of transmission. This will entail government inspection of the content of all international messages, even though internal messages continue, by and large, to be free of scrutiny.

Another speaker at the conference, Claire Messier of Digital Equipment, disclosed that an electronic mail system running within the company since January, 1978 had increased users' productivity by around 5%-15%, cut phone calls by 15% and inter-office memos by 20-25%.

The system has 725 users, and runs on a single dial-up PDP 11/70 with standard DEC VDUs. The software is Comet from Computer Corp of America of Cambridge, Mass.

HOW THE MINI CAN BENEFIT THE MAINFRAME SUPPLIER

Manufacturers' key to expanding markets

A MAJOR mainframe vendor is motivated, as are most businesses, by the basic need to maintain and grow revenues and profits, says Honeywell's DAVID NORTON. He believes that in line with this fundamental objective, a vendor's principal concern will be to ensure that existing users do not leave the fold.

This is done by providing competitive products and services that meet the users' current requirements and continue to meet them as their needs evolve and change, as well as enticing users of competitive equipment into its ranks.

Against this backdrop, Norton discusses how minicomputers can play an important role in the mainframe suppliers' strategies emphasising their role in distributed processing.

Norton is the marketing operations and planning manager of Honeywell's minicomputer and terminals division.

● Transaction processing is one of the requirements for a distributed system. Our photograph shows a transaction processing configuration based on a Level 6 mini using one of Honeywell's latest application packages, TPS-6.

IN the industry some of the most overworked of buzz phraseology concerns "distributed processing" and "distributed systems". Despite, or maybe as a result of this, distributed systems are a reality. The philosophy they represent is here to stay and offers the user real benefits.

Data processing has evolved from the early batch era to the stage where a user demands, and is becoming accustomed to, immediate access to information and processing capability from his place of work.

Of course, meeting these demands is no problem for the mainframe supplier — just increase the size of the central site and install a network of terminals!

There are drawbacks to this approach, however. Communications operating costs may be high, response times may not be all that is required, and central systems are complex to operate and maintain. But perhaps the most significant factor of all in the user's eyes is that he does not feel that he controls his computing needs.

This factor, the desire for autonomy, can be the prime justification for a distributed approach. Further support comes from the offsetting of the other centralised system disadvantages.

This trend towards other user groups in an organisation having its own computers has been actively encouraged by the specialist minicomputer vendors.

They have come to appreciate the feeling of local independence from the central service organisation, the cost-effective business solution approach. The message is seductive and the threat to the traditional mainframers' business significant.

Possessing a strong minicomputer product allows the mainframe supplier to respond to this challenge in kind, however.

Systems solutions can be offered using minis and mainframes combining the control of a centralised mainframe system and the effectiveness of the distributed approach.

For the mainframer to respond to the market today it is essential that he be able to provide the degree of distribution necessary for the user's style of operation, making the system fit the organisation rather than the reverse — and the minicomputer is the key to this capability.

Within such a mainframe-associated distributed system minicomputers will be found playing many roles: as a front-end communications processor, as a routine device in complex networks, supporting simple remote functions such as remote job entry and distributed data entry, and as a comprehensive satellite processor providing local users with their own batch and transaction processing capabilities.

The supplier is also in a position to satisfy his user's stand-alone systems needs with the advantages of a single source for supply and maintenance and inherent compatibility between mainframe and mini should it be required.

By the same token he can sell minis to users of competitive mainframe equipment.

The market for minicomputers is growing at about 30% per annum and, as such, represents the most rapidly expanding business area for the industry.

Where better for the established mainframer to look for increased revenues, the more so since some of the business undoubtedly will come from existing users and would otherwise possibly be lost to a minicomputer independent

Additionally, many of these prospective purchasers will already be users of competitive mainframe equipment.

Sales into this area, whilst useful in their own right, will represent an ideal vehicle for demonstrating the merits of dealing with a different company as a lead to bigger things!

For most mainframe suppliers a minicomputer provides the basis for extending the product offering into new areas, for example by the provision of office automation products, integrated with the information processing system and its associated networks.

The mainframe's mini appears within high volume output printing systems, as the "engine" within industry — specific terminals and application packages.

Competing within the fast evolving minicomputer market provides a technology spur having spin-off across the whole spectrum of a mainframe supplier's product.

Contact Steve Bass

For Advertising Rates
PHONE 01-261 8293

The Trade Mark No. 1024336 consisting of the word DATAGRAPHIX and registered in respect of "Computers and apparatus for microfilming the output of such computers; apparatus for recording and printing computer output data and for producing microfilm or microfiche viewers; and parts and fittings included in Class 9 for all the aforesaid goods; all for sale in England and Scotland" was assigned on 18 October, 1978, by Datagraphic, Inc. of 1895, Hancock Street, San Diego, California, United States of America, to Datagraphix Limited, of New Lodge, Drift Road, Windsor, Berks. SL4 4RQ **WITHOUT THE GOODWILL OF THE BUSINESS IN WHICH IT WAS THEN IN USE.**

HAZELTINE 1200
Excellent condition
2 for £700
Or £375 each
Small Systems
Engineering Ltd.
Tel: 01-637 0777

NORTHERN IRELAND
COMPUTER MAINTENANCE
Mainframe to Micro
Lowry Electronics Ltd.
Tel. Belfast 652406

LOOK AT THE CROWD IN OUR

Our Market Place feature (today on page 14–15) enables you to reach a vast 82,000 circulation of whom no less than 91% personally request their copies. No wonder we attract more display advertising than any other computer journal. 35% of all computer ads appear in our pages—and Market Place is the most cost-effective of all for leasing. 2nd hand hardware, maintenance services, wholesale goods, and contract staff . . . The rates are:

3.35 s.c.c. £9.35
36-98 s.c.c. £7.70
99 s.c.c. and over £6.05
Series discounts: 7—5%, 13—10%, 26—15%, 52—20%.

COMPUTER WEEKLY

CONTRACT
or
PERMANENT

We are the Specialists!
ANALYSTS PROGRAMMERS OPERATORS
VDU/KEY PUNCH OPS DATA CONTROLLERS

FOCUS
Computer Services Limited
01-487 5781
(emp agy)

PDP 11/04•11/34•11/60
BASED COMPUTER SYSTEMS
FAST DELIVERY
KEEN PRICES
New
Hardware
FAST DEC!
FROM
SYSTEK
HR HOUSE, HIGH ROAD
NORTH FINCHLEY, LONDON N12 OAZ
01-349 2911
Telex: 28227

Nelson Computer Services Ltd

Suppliers of new and refurbished equipment

BURSTERS, DECOLLATORS, ETC.
DISC, TAPE, CARD STORAGE
DATA PREPARATION EQUIPMENT
SPECIALIST IN IBM AND UNIVAC
B.S.L.R.M.

IBM 029 A22 (IBM or ICL code)
UNIVAC 1701, 1710 VP and VIP (IBM or ICL code).
Kode Up or VIP Card Punch Verifiers.
PFE 1104 Guillotine
Wilkes MMB Burster
BPC A Frame Decollator
Wilkes Mini Deleaver.

80 COLUMN HAND PUNCH
Ex-stock from £95 + VAT

Ring Mike Jacques on Rossendale (07062) 29125
ST. JOHN'S COURT, RAWTENSTALL, LANCS. BB4 7PA

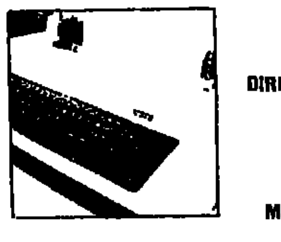
WE BUY
CASH

IBM 3333-011
IBM 3330-011
IBM 3350-A02
IBM 3350-B02
IBM 3420-008
IBM 3803-002
IBM 3168-4MB

offer with price and date of delivery to:

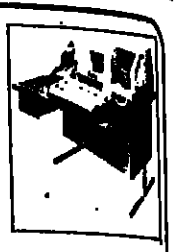
Datenverarbeitung
Klaus Hübner GmbH
Reinsburgstr. 57
D-7000 Stuttgart 1
Tel. 711-618676

FOR SALE
£200 Wilks Modular Delever
Model MDL Hardly used
New price £592
Contact J. Harrison
Tel: 0705-832551
(Brook St. Burco Manager)



TERMINALS
DEC LA36
LS 120

DIRECT DATA MARKETING LTD.
44 HIGH STREET
BRENTWOOD
ESSEX
Buy, Rent or Lease
Maintenance Provided
BURSTERS/
DECOLLATORS
Tel: Brentwood — 229379
(0277) 213273



CARD PUNCHES
IBM 029 059
VP/VIP (incl. Reproducing)

DEC DEC DEC DEC DEC
STOCK TO CLEAR AT HEAVILY DISCOUNTED PRICES
PDP 8A — 400 Series, 2 off, 32K words code memory. Other options available as required — £2,000
PDP11/34 and 11/04 Systems and Peripherals for immediate delivery. Also various Refurbished PDP8 and 11 Systems, and Modules from stock
S.K. SYSTEMS LTD.
Stevenage Road, Hitchin, Herts.
Telephone (0462) 35267
Telex: 826715 S.K. SYS.

SCREENED TWISTED PAIR INSTRUMENTATION CABLE SUPPLIED
Nationwide Installation Service available
Contact: Paul Loader
01-959 6862

COM MICROFICHE READERS
Up to 48x — From £109
Immediate delivery.
B.D. MICRO SYSTEMS LTD.,
WINDSOR 68053

FOR SALE
Litton ABS 1231 Computer comprising 1602 processor, tape reader, punch keyboard and model 30 printer.

Write or ring: George Elliott, Europa Lodge Hotel, Horley, Surrey RH6 0HB. Tel: 02934 5599.

Now! IBM 3277 Systems when you need them

(not when IBM can supply them.)

Where? From Dataserv, one of the worlds leading suppliers of used IBM Terminal Systems. So for:

- Fast delivery of 3277 crts, 3271/72 ctlrs and 3284/86 printers
- The lowest priced 3270 equipment available
- IBM 3270 equipment delivered eligible for an IBM maintenance agreement
- Completely refurbished 3277 equipment

For more information contact MARC KEEPN

dataserv
3 Union Court, Richmond, Surrey TW9 1AA
Tel. 01-940 2321. Telex 926734
"We're changing the way people buy their IBM terminals"

Knight is right for contract staff

Knight Computer Services Ltd.,
14 Old Park Lane, London W1Y 4NL.
Knight **01-491 4706**
Staff Services Division of BOC Datasolve Group and a member of Computing Services Association

FOR SALE
BURROUGHS COMPUTERS
TC5100, AE500, B721
For further particulars
Phone 0783-293818

S.V. 160 PRINTER
(OLIVETTI)
with accessories. Hardly used, offers. Tel: Steve Parker, Chester (0244) 313731.

UNIVAC BC/7 £15-hr.
SYSTEM 3 — BC/7
CONVERSION
RPG II & DCL/SCL
Analysis — Design — RPG II
FOXES COMPUTER SERVICES LTD.
High Wycombe (0494) 881741

MEMORY TYPEWRITER
IBM MC82

Price	£4,500
IBM New	£5,550

Contact: David Donovan, Chief Accountant, Premier Computers, 01-940 1134. Telex 926734.

buying
selling
TIME?
CTB
Computer Time Brokers
[illegible]
CWT **CTB**

tap
SERVICE BUREAU
Central London
Providing Batch RJE/TP facilities for OS and DOS users at attractive rates.
ITEL AS5-3 3072K
OS/SVS/HASP VM/CMS
PHONE
01-242 9283
01-836 0355
Time and People Limited

NEXT TIME . . .
REMEMBER

PARKMANS
WE PRODUCE OUR MULTIPLE AND SINGLE PART BESPOKE BUSINESS FORMS ON
MULLER-MARTINI
GOEBEL MULTIFORMER AND
HAMILTON COLLATING MACHINES
&
HIGH QUALITY CONTINUOUS AND CUT SETS
●
PHONE.
ROGER PADFIELD
SALES LIAISON OFFICER
WITH YOUR REQUIREMENTS
AT
PARKMAN BUSINESS FORMS
CASTLE PARADE, MONMOUTH ROAD,
USK, GWENT Tel. 02913-3434
TELEX 49536

370/148 KOO
(2 Megabyte) with 3047 Power Supply.
Available for lease or sale July 1979.
Leases of 9 months or 2 years and longer considered.
Apply Bracknell 58253

COMPUTERS
BOUGHT
AND SOLD
E O B EQUIPMENT LTD
Tel. 0783-293818
Telex 537763

WANTED
Bowe 302 Guillotine or Similar
Ring: Comp Manager
Accrington (0254) 37211

WEBSTER D/P SERVICES LTD.
FOR USED DP EQUIPMENT
BUY OR SELL THROUGH WDP
NEW DE LUXE 80 COLUMN
HAND PUNCHES (EX-STOCK)
WDP

01-464 9011
WEBSTER D/P SERVICES LTD.
65 WIDMORE ROAD, BROMLEY
KENT BR1 3AA

KEY OPERATIONS ASSISTANCE LTD
CONTRACT
★ OPERATORS ★
★ PROGRAMMERS ★
★ PUNCH OPERATORS ★
LEADING SUPPLIERS OF CONTRACT OPERATIONS PERSONNEL THROUGHOUT EUROPE
SAVE TIME AND MONEY
CALL US FIRST
LONDON
01-439 755/1
MANCHESTER
061-833 9355/7
EUR OPS EUR OPS
27 NOEL STREET LONDON W1

FOR SALE
Dataterm Production Control and Data Collection System. Complete with a 70 characters per second facit punch. Situated at Colchester.
£1000
Reply Box No. 1017
Computer Weekly

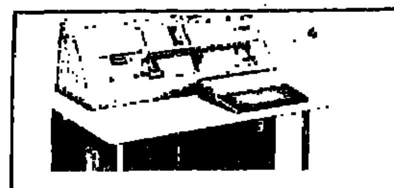
"GIVE US THE . . .
tools food, clothing, heating — all cost money, but all are involved in caring for children — and much more
If you give us — not tools — but your computer waste, we can do the job of caring for over 5,000 children who need love, care and security
CAN YOU HELP?
Please contact
Paul Harrison
National Children's Home
85 Highbury Park
London, N5 1UD
01-226 2033
. . . we'll do the job."

OPERATORS
CONTRACT AND PERMANENT

FOR A PROMPT SERVICE
PHONE 01-439 6481 NOW
and speak to a top professional in an established company
(24-HOUR ANSWERING SERVICE)
EFFECTIA GRAVIS

Licence No. SE(A)62

EFFECTIA GRAVIS
Personnel Consultants
01-439 6481
National House
66 Wardour Street
LONDON W1V 3HP



IBM IBM IBM
029, 026, 059 EX-STOCK
★ All fully refurbished
★ Free warranty
★ Guaranteed maintenance
★ Various code options available
Tel. 0268-710292
C.D.L. COMMERCIAL DATA LTD., Downham Road, Ramsden Heath, Billericay, Essex

FOR SALE
Air conditioning equipment for Computer Room, originally installed mid 1974 and meticulously maintained since.

Comprises: 3 Computaire Mk. IV's; 3 SLO 36; 1 Fresh Air Unit; 1 Lumatic Humidifier.

Units will be broken down and stored but can be inspected in situ until 26th February 1979.

Also for sale: Philips P352 Visible Record Computer. Installed 8 years, in perfect working order.

Contact:
The Valuer
Borough of Milton Keynes
Sherwood House
Sherwood Drive
Bletchley
Milton Keynes MK3 6QE
Telephone:
Milton Keynes 71171

leasing?
buying?
selling?
CRB
Computer Resale Brokers International Ltd
[illegible]
CWT **CRB**

HEXAGON
computer services
[illegible]-3671
145 WARDOUR [illegible] LONDON W1V 3TB

Contract & Perman[illegible] recruitment
Total DP Support at [illegible]
Programming Operating
Data Preparation Systems
Data Control [illegible]

What happens to workers in industries such as printing who are displaced by new technology? Following our reports on the technical side of the changes in US newspapers (CW, September 21, 1978), JAMES McDONALD, a printer who was made redundant and became a journalist, tells what happened to his colleagues.

Technology 'victims' turn disaster into a second chance

AN alarming notice greeted the composing room employees of a medium-sized daily newspaper in the eastern United States when they arrived for work one day.

Although not an ultimatum, the company informed the 220 employees that, because computerisation of the composing room, 75 jobs would be lost within eight months.

The shock was traumatic. Many wondered who would be forced out. Others speculated on the difficulty of trying to live without a job. It was finally happening, the workers declared — everything the omniscient "they" had said would happen: computers were replacing workers, threatening to place them on public welfare.

After the initial shock, and when the dust had settled, a unique plan was unfolded.

The company was not simply firing the 75, but providing them with practical means for continuing as productive citizens. Since this was a union shop, dismissals were to be voluntary. Alternatively, the compositors with least seniority would be dismissed first.

However, the incentives offered by the publisher caused no problems in finding workers willing to terminate their employment.

The Providence, Rhode Island Journal-Bulletin was among the first American daily newspapers to make the switch from hot metal composition to the now-familiar cold-type process. During the transition period, less and less work was either available to, or required of, the compositors, whose jobs were gradually being eroded by computerisation.

In a manoeuvre which could well serve as a model for other employers considering the impact of mass layoffs, the Journal-Bulletin offered incentives which made the prospect of unemployment more palatable.

Among the company offers were:

- Full-tuition scholarships to a four-year college or university anywhere in the continental United States, plus 200 dollars per week living expenses during that period;
- severance pay of 16,000 dollars;
- interest-free loans of 25,000 dollars for five years to anyone desiring to start his own business, plus the severance pay, and
- several additional offers incorporating some of the above combinations.

The company publishes two daily newspapers: the morning Journal and the evening Bulletin, each with five editions. On Saturday, both papers are combined and, on Sunday, the Providence Sunday Journal is published. With such a heavy production schedule, and despite the layoff of 75 compositors, it is not necessary to point out the effectiveness of computerised newspaper production.

From a layman's view, however, there appear to be some shortcomings in the system. Many readers complain of an inability to read the smaller sizes of type, a situation which, no doubt, will improve as further camera or printing refinements are developed.

Another problem occurs when paste-up artwork sometimes "slips" out of position and overprints in the wrong place on the page.

Despite these minor faults, management is apparently convinced that cold-type production is here to stay, and continues to nibble away at the remaining jobs in the composing room.

Since the original 75 compositors voluntarily terminated their employment, the company offered retraining in other departments to several other compositors. After 22 years as a compositor, I accepted an offer to be retrained as a staff writer, along with five of my co-workers, in 1977. That same year, six more were transformed into advertising salesmen. An informal survey shows that we are all highly satisfied with our mid-life career changes.

But what about the original 75 who left the company under pressure of computerisation?

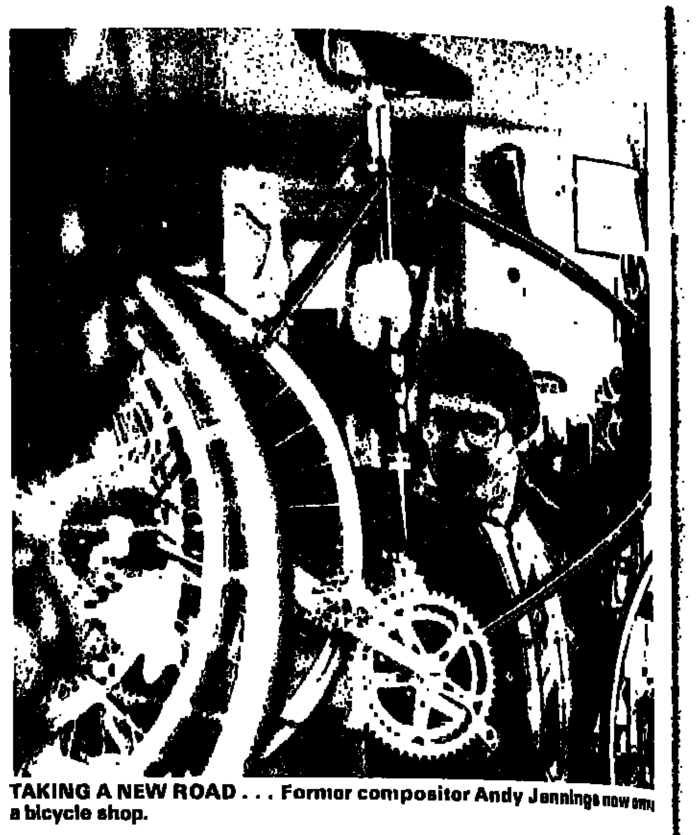
A representative sampling leads even the most casual observer to conclude that here, indeed, is a happy group of men.

Donald Miller always had an urge to fly a plane, so he enrolled in flying school at a local airport. At the same time, he operated his own small job printing business in the garage attached to his home. When he tires of the smell of ink or the monotonous clatter of the printing press, he thinks nothing of taking his wife along for the ride whenever a paying customer wants to be flown to a destination.

John Pranckunas and Joseph Lavery decided to become car mechanics and enrolled in a trade school for that purpose.

Three of the younger ex-compositors took advantage of college scholarships. Roger Guevremont chose a business college curriculum, while Ronald Jeffreys aimed at a career in real estate. The third member of the trio, Robert Barker, already posessed a university degree in finance. He returned to college in pursuit of another degree in the field of agricultural management, after which he will combine his education with a love for farming, pursuing a career devoted to efficient food production.

At the opposite end of the age spectrum, 52-year-old John Choquette chose early retirement. While supporting himself on a partial company pension, John manages a mobile home trailer park near the popular seashore resort town of Narragansett, Rhode Island.



TAKING A NEW ROAD . . . Former compositor Andy Jennings now owns a bicycle shop.

When he reaches normal retirement age, Choquette will receive full company pension under the terms of his employment termination. In his spare time, he has developed an interest in furniture refinishing.

Among other things, 36-year-old Andy Jennings is keenly interested in physical fitness. This enterprising former compositor has combined his acquired management talent with a love for bicycling into a successful business which he named "D. J. Handlebars." Along with his wife and children (during school vacation periods and whenever they feel like it), Andy sells and services 10-speed bicycles.

The most common remark to be heard among these and other former compositors goes like this: "It's like being reborn. If it were not for computers, I'd still be facing the daily drudgery of punching a time clock and waiting for the whistle to blow before starting and stopping work."

Admittedly, without the incentives offered by their employer, the present status of these former compositors probably would have been very different.

The fact remains that the sometimes traumatic result of industrial application of computers can be softened when such use is balanced against the socio-economic effect on the working man. Present worldwide inflation is often attributed to greed among many segments of the business community, from producer to consumer. On the other hand, it is easy to blame computers for high unemployment levels.

The reactions of these and other workers show that while computers may be capable of eliminating some jobs and creating new ones, the blame more properly lies with uncaring or thoughtless companies which ignore their social responsibilities.

My personal experience demonstrates the dramatic effect which computers have had on my life. When I was first taken on a tour of a composing room in my college days, it was a case of love at first sight, causing me to abandon my planned future as a writer and to become a compositor instead.

The apprenticeship lasted six years, followed by journeyman status which, I thought, placed me among the elite of skilled craftsmen. The creativity and artistry of quality typography quickly buried any previous desire for writing — until cold-type arrived on the scene. Most hot-metal printers claim that creative typography has deteriorated as a direct result of computerised newspaper production.

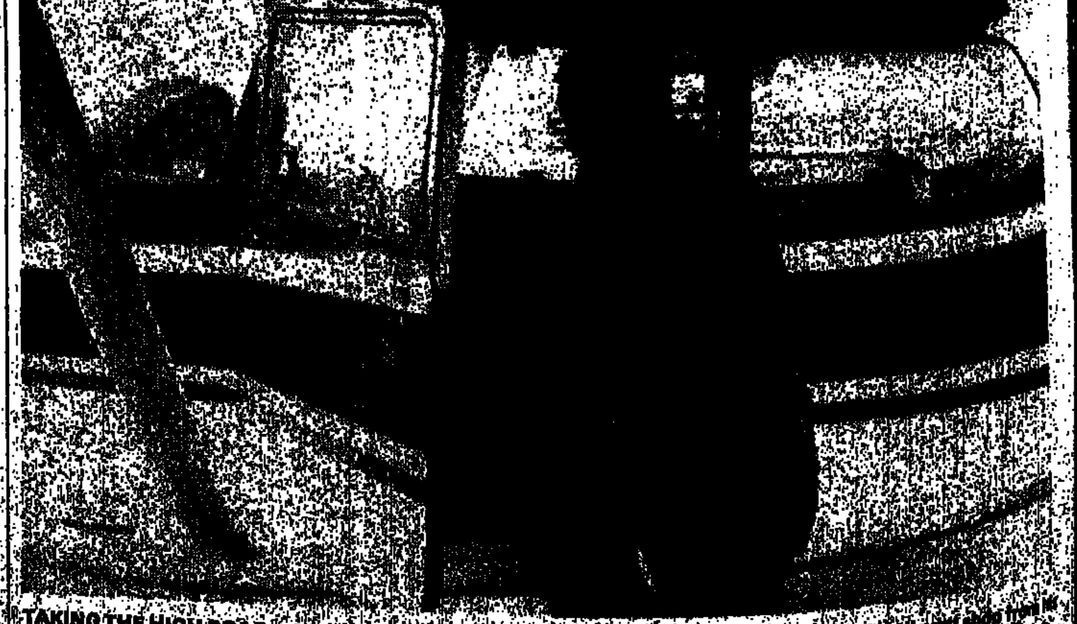
Although I agree with that consensus, it required a great deal of effort to overcome the fear of leaving a secure, well-paying job for an uncertain future in a new occupation, especially at the age of 45. As any middleaged man will attest, employers are reluctant to hire those who have reached that age group.

My employer remained the same, and I was allotted a one-year probationary period to test my writing ability. During that time, nagging doubts about this ability persisted, almost to the point of intolerability.

I became a regular staff writer, currently employed in a regional office maintained by the Journal-Bulletin.

Ironically, I've discovered that my life has returned full circle to that point, almost 30 years ago, when the "writing bug" took its first bite into my fingers. I fully concur with my former fellow compositors: It is like being reborn!

Not only that, but I've discovered mid-life career change to be a powerful source of satisfaction — not the formidable opponent I once believed it to be.



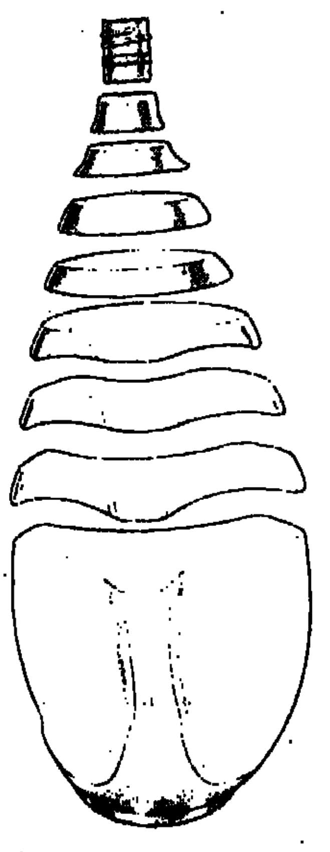
TAKING THE HIGH ROAD . . . Donald Miller flies a light plane part-time while running a small print shop from his garage.

Using CAD to develop better and better bottles

Computer-aided design techniques are playing an increasingly important part in industry. United Glass has been using CAD techniques since 1971 in the design of bottles and mould equipment. This article examines the growth in the company's use of the computer as a design aid.

UNITED Glass, one of the world's leading glass container manufacturers, producing more than 40 million bottles per week, uses computers extensively in the design of its bottles and mould equipment. Developed over the last eight years, the UG software has been adopted by Owens-Illinois, said to be the world's largest packaging manufacturer and a 50% shareholder in UG.

Interest in the use of computers to assist its designers began in 1971 when Frank Page, manager of the Glass Container Division's design department looked at the potential for computer aid.



Stress analysis of a bottle — one of the many CAD aids used by United Glass.

UG decided to develop its own programs to assist in the technical groundwork and other calculations necessary for bottle design, mould manufacture and bottle-making.

The first stage in CAD development was the writing of a program for calculating volume displacement of round bottles. The displacement of any bottle must correspond exactly to its predetermined brimful capacity plus the preselected volume of glass necessary to ensure sufficient strength. In many bottle types, such as whisky or milk bottles, the displacement must be guaranteed to the customer. The designers nominate dimensions which can be automatically changed to meet the required displacement.

The final dimension is output on the teletype ready for the designer to add to his drawing, also providing information in tabular form for production of a numerical control tape. The tabulated output is used by Johnson-Radley, UG's mould-making associates for the production of NC tapes for automatic mould cavity machining.

This program is still in use today, though calculation of the volume now takes less than a second with data preparation taking about another 10 minutes.

In 1974, a program was written for handling irregularly shaped containers and two years later UG began using a program developed in the US by Owens-Illinois. This program handles all mould equipment calculations and also takes into account the parameters of the glass machine settings such as the speed of the machine, temperature and glass viscosity, and provides the glass distribution which will be obtained when a bottle is actually made.

Now UG's computer system integrates programs stored both at St Albans and in the US. The St Albans terminal uses a keyboard and VDU with satellite links to the US. Most of the design work is done inhouse on a Prime 300.

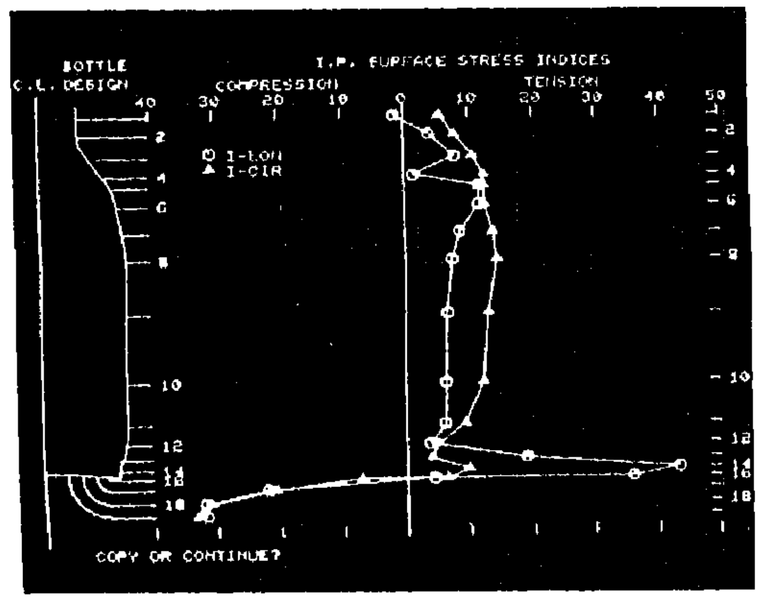
On a new press and blow bottle and mould design, a designer would first prepare a tape with information on the basic shape of a container, the type of machine, glass density and gob temperature, bottle making machine speed and other information.

The company has built up a library of about 1,000 mould shapes and can now draw moulds complete with cavities.

An image of the proposed container and mould equipment is then drawn on the screen, showing basic mould shapes which satisfy the information which has been given. The designer can then change the design on-screen and, when he feels satisfied with it, display the glass distribution, which will be obtained during manufacture.

If the designer is not happy with this, he can then change any of the parameters, such as gob temperature or machine speed, and the program will calculate the effect of these changes. If the result is satisfactory, hard copies can be obtained of the results. The Benson 2222 plotter provides the designer with working drawings of the bottle.

"We now have complete computer assistance at every stage of design," says Frank Page, "and the integration of our own and O-I's work has been a major example of what can be achieved by the affiliation of two leading bottle makers."



Graphically checking the cross-sections of non-round bottle designs to ensure the shape meets the specification.

Coping with curves

OTHER CAD systems exist for the manufacture of objects such as bottles which have doubly curved surfaces. These systems include the CAD Centre's Polysurf package which incorporates ideas from earlier systems such as NMG and Multipatch and of course in-house development systems, for example, for TV screen manufacture and car headlamp reflector and lens design. Such systems are generally used after the geometry is defined.

Polysurf combines interactive shape representation with interactive tool path generation for NC machining.

Appointments

RATES
£10 per single column centimetr
SERIES DISCOUNT
7
13
26
52

CHRIS PRIER
Assistant Classified Manager
01-261-8028

LONDON
[illegible]

MANCHESTER/GLASGOW
Owen Kelly 061-872-4211

BIRMINGHAM/BRISTOL
Basil McGowan 021-356-4838

COMPUTER WEEKLY — Highest requested circulation at a cost per thousand 25% lower than the nearest competito

---

MYRIAD

LEAD PROGRAMMERS AND PROGRAMMERS

FOR IBM REAL TIME AND DATABASE DEVELOPMENT

NEAR WINDSOR **TO £6000**

Our Client, a successful manufacturing company within an international group, are at present undertaking the development of several new on-line application systems and are now keen to recruit programming staff at both the junior and more experienced levels.

System development is based upon an IBM 370/158 with a strong emphasis on IMS database and teleprocessing facilities offering the successful candidates the opportunity to be trained in these new techniques and enhance their technical expertise.

For the programming positions a minimum of one year's COBOL programming is essential. The lead programming positions require at least two years' experience preferably gained on IBM hardware and the candidates appointed can look forward to leading a small programming team.

The company offers excellent career prospects with the possibility of developing into the areas of analysis, software or database design. Company benefits are commensurate with a major organisation and include 25 days' holiday, subsidised canteen facilities, an active sports and social club, relocation assistance where appropirate.

FORTRAN CONSULTANT

C. LONDON **TO £8000**

A rare opportunity has arisen within an organisation providing consultancy services to Mining organisations throughout the world, for an experienced FORTRAN programmer to join a small multi-disciplined team whose activities encompass the fields of geology, mine engineering and metallurgy.

The company has developed an extensive range of sophisticated orebody evaluation and mine planning systems which are used in mining projects throughout the world.

Candidates should offer a minimum of three years' FORTRAN experience and be able to support this with good academic achievements. Knowledge of the mining industry would be a considerable advantage. The person appointed will provide a major contribution in developing future applications and the ability to communicate effectively with Users in establishing their exact requirements is therefore essential.

OVERSEAS TRAVEL for short periods will be required in order to support various projects. The company offers an attractive starting salary and is located in modern offices in Central London.

NEW INSTALLATION NEW OPPORTUNITIES

for Programmers and Analyst/Programmers

N.W. LONDON **TO £7500**

Having recently installed a powerful medium range IBM configuration to cope with the first stage of their impressive development programme our client is now seeking additional Programmers and Analyst/Programmers to play a major part in developing new applications.

The company is a major retailing organisation with an ever-increasing multi-million pound turnover. Their success has partly been attributed to the utilisation of extensive Management Information Systems available, and in order to retain their competitive edge, several comprehensive systems are now planned using both on-line and batch techniques.

Opportunities exist for experienced Programmers and Analyst/Programmers in small specialist project teams. Working in a friendly, technically stimulating environment every effort is made to afford individuals responsiblity and challange and so ensure total job satisfaction. Knowledge of on-line processing will be a distinct advantage, but training will be given where necessary.

Competitive salaries are accompanied by attractive fringe benfits associated with a major organisation.

MYRIAD APPOINTMENTS LIMITED
30 Fleet Street London EC4Y IAA
01-353 0981

SYSTEMS DESIGNERS LIMITED

Quality first

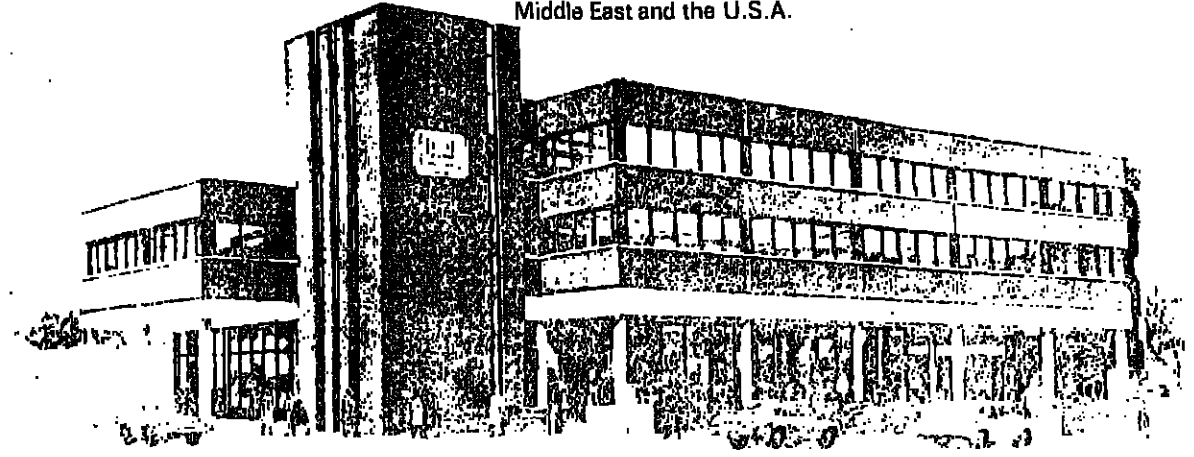
Join the experts - explore the frontiers of computing technology

Informal interviews at The Britannia Hotel Grosvenor Square from 12.00 hrs-21.00 hrs. on Tuesday, 17th April, 1979

SDL is a professional organisation with total system and software capability. To help meet the continuing high demands placed on our services we need Consultants, Engineers and Programmers.

We are holding informal interviews at The Britannia Hotel Grosvenor Square, London, W.1 on Tuesday, 17th April, 1979 from 12.00 hrs.-21.00 hrs., and we will be pleased to welcome anyone interested in learning more about our company and the rewarding careers offered.

If you can meet the challenge of Consultancy and Engineering in the field of mini and micro computer real-time applications, then please drop in for a drink and a chat with our managers and consultants. Systems Designers' staff benefit from a wide variety of experience both of project applications and computer systems, and the opportunity to work not only in the U.K. but also in Europe, the Middle East and the U.S.A.



Our principal work areas are currently:—

COMMUNICATIONS
Message switching, Telex systems, communications management systems and computer communications.

INDUSTRIAL
Process control and monitoring, plant control simulation, high speed data analysis and distributed micro-processor system.

MILITARY
Modelling, avionics and Radar systems, complex rigs, simulators and microprocessor missile systems.

SOFTWARE PRODUCTS
Compiler technology, software design techniques, MASCOT and information processing systems, STATUS and VIEWDATA systems.

CONSULTANCY
Complex military systems, software and systems development technology.

Salary is negotiable up to £10,500 p.a. according to ability and experience.

The company offers productivity bonus, insurance and pension schemes and assists with relocation if required.

If you cannot make it to the Britannia Hotel telephone Ann Gregory on Camberley (0276) 62244, or write to Bill Hockey, our Operations Director at:—

Systems Designers Limited
Systems House
1 Pembroke Broadway
Camberley
Surrey GU15 3XH

An Invitation to All —

GROCKLE* PROGRAMMERS

Come and join our growing systems development team in Bournemouth.

You'll be involved straightaway in the development of our Data base project, working initially towards the introduction of System 38 + VDU's in 1980. Having learnt about us and RPG III, you'll work closely with other team members and user departments.

SENIOR PROGRAMMERS

Two years experience minimum — Team project experience — Ability to participate in system design.

PROGRAMMERS

one year's experience minimum — Lots to learn ahead in pleasant, informal work environment.

JUNIOR PROGRAMMERS

A great opportunity to make progress. Full training provided.

RPG II experience desirable in each case, but not essential.

We'll pay you a competitive salary with good fringe benefits, and you'll work in pleasant modern surroundings close to the town centre and about two minutes walk from the sea front. The New Forest and Purbecks are within easy reach.

*GROCKLE — not an obscure language, but a local term of friendly abuse for "outsiders", particularly those who drive Morris Minors!

Please contact:
Mrs. H. M. White
Personnel Manager
TEACHERS' ASSURANCE
Teachers' Assurance House,
12 Christchurch Road
Bournemouth BH1 3LW
(Telephone: Bournemouth (0202) 291111)

TEACHERS' ASSURANCE

THE VICTORY INSURANCE COMPANY LIMITED

COBOL PROGRAMMERS

We are specialist International Reinsurers and are among the leaders in our field. The Company's Chief Administration Office is based in Folkestone, an attractive town situated on the South East coast of Kent, where we offer challenging opportunities for Programmers in relation to a Data 100 system linked to IBM 370/145 and 158 computers. Just consider the following . . . .

ARE YOU

- ✱ Keen to develop and gain absolute job satisfaction ?
- ✱ Self-motivated and forward thinking ?
- ✱ Aged 23 – 35 ?
- ✱ Keen to join a progressive team to develop a new Data Based system ?

DO YOU

- ✱ HAVE A SOUND KNOWLEDGE OF COBOL ?

WE OFFER

- ✱ Excellent working conditions
- ✱ Attractive salary scales
- ✱ Favourable House Purchase facilities
- ✱ Assistance with relocation expenses
- ✱ Contributory Pension Scheme
- ✱ Free Life Assurance
- ✱ Permanent Health Sickness benefits
- ✱ Flexible Working Hours
- ✱ Subsidised Restaurant facilities
- ✱ Sports & Social Club

If you feel that you meet our requirements, we want to hear from you. Please write in confidence, giving a brief account of your achievements to date to:

Assistant Staff Manager
The Victory Insurance Company Limited
Victory House, Castle Hill Avenue,
Folkestone, Kent CT20 2TF

Systems Designers

Here's a top opportunity to use your solid experience in programming batch and real-time on Honeywell or Datapoint equipment in systems design with the world's most advanced radial tyre manufacturers. Ideally you should also be interested in training young programmers. Send for our information facts-pack today by telephoning Stoke-on-Trent 48101 ext 173 or writing to John Sellers, Michelin Tyre Company Limited, Stoke-on-Trent ST4 4EY.

Switch to Michelin

WELLORAX

IBM BUREAU + FACILITIES MANAGEMENT OPPORTUNITIES

We are a rapidly developing service company specialising in the Bureau or Facilities Management operation of many commercial Customers. We specialise in IBM hardware using RPGII on the 10 System/3, System/32 and System 34 computers we (currently) run. We offer excellent prospects experienced, service-oriented people, amongst which are plans for the installation of two large System/38 configurations over the next 18 months.

BUREAU SYSTEMS & STANDARDS MANAGER:

Based in Kingston with experience of managing a number of programmers, preferably in a bureau environment. Must have a track-record of success and be very practically user oriented in systems analysis and RPGII programming. Will report to Production Director.
Salary: £7,500-£8,500 according to experience, plus company car.

F.M. ANALYSIS & PROGRAMMING CONTROLLER:

Based in Kingston but with clientele ranging over Greater London. Must have proven successful track-record of analysis, RPGII programming and self-motivation. Prospects of rapid promotion if objectives are met.
Salary £7,500-£8,500 according to experience, plus company car.

F.M. PROGRAMMER/INSTALLATION CONTROLLER

Based in Kingston on System/34 with interesting development potential. Considerable independence in friendly host company.
Salary £4,500-£6,000 depending on experience plus company car after 12 months.

F.M. PROGRAMMER/INSTALLATION CONTROLLER:

Similar to above. Salary £4,500-£6,000 according to experience, plus company car after 12 months.

F.M. ROVING SUPPORT OPERATOR:

To cover our nine locations and occasional external work. Must have keyboard facility and at least one year's experience on IBM System/3, /32, or /34.
Salary £3,500-£4,500 + car.

BUREAU SENIOR ANALYST/PROGRAMMER:

Based at Kingston with interesting range of existing applications and prospective developments, including conversion to System/38. Minimum experience three years' RPGII and varied.
Salary £7,500 plus company car after qualifying period.

3741 DATA PREPARATION OPERATORS:

Based in a friendly atmosphere at Kingston. IBM experience desirable but not essential. Salary basic £3,400 + very noticeable monthly bonus after two months' probationary period.

Please write with brief career details to: Wellorax Limited, 12 Canbury Passage, Richmond Road, Kingston-upon-Thames, Surrey.

As a rapidly expanding service organisation specialising in the development and installation of systems for small business computers such as the IBM 5110, System/34 and System/38, we now need to increase our existing teams.

MINI SYSTEMS GROUP

SALES EXECUTIVE:

We have had such a high level of success in Marketing our business packages for the IBM 5110 that we now need another SALES EXECUTIVE to help consolidate our premier position in this field. A knowledge of small business systems is preferred, although extensive training will be given to the successful candidate.

In addition to selling systems for the 5110 he or she will be expected to contribute to our planned expansion into other machines and markets.

This is a significant career opportunity for the right person, offering a chance to join one of the few companies properly prepared to take full advantage of the coming increase in the small business system area.

Although based in Kingston, the position requires a high degree of mobility and therefore a COMPANY CAR is provided.

The anticipated remuneration package is £10,000, although there is no upper limit.

PROJECT LEADER:

Based in London. A knowedge of BASIC is essential. Systems Analysis and design experience with first time users preferable.

Salary circa £7,000.

RPG SYSTEMS GROUP

PROJECT LEADER:

Based in London. Detailed knowledge of commercial computer systems, systems analysis and design, with a minimum of five years' experience at least two of which must have been RPGII programming.

Salary circa £7,000.

ANALYST/PROGRAMMERS:

Based in London and Birmingham. Must be capable of working as part of a team designing and installing systems for our many customers.

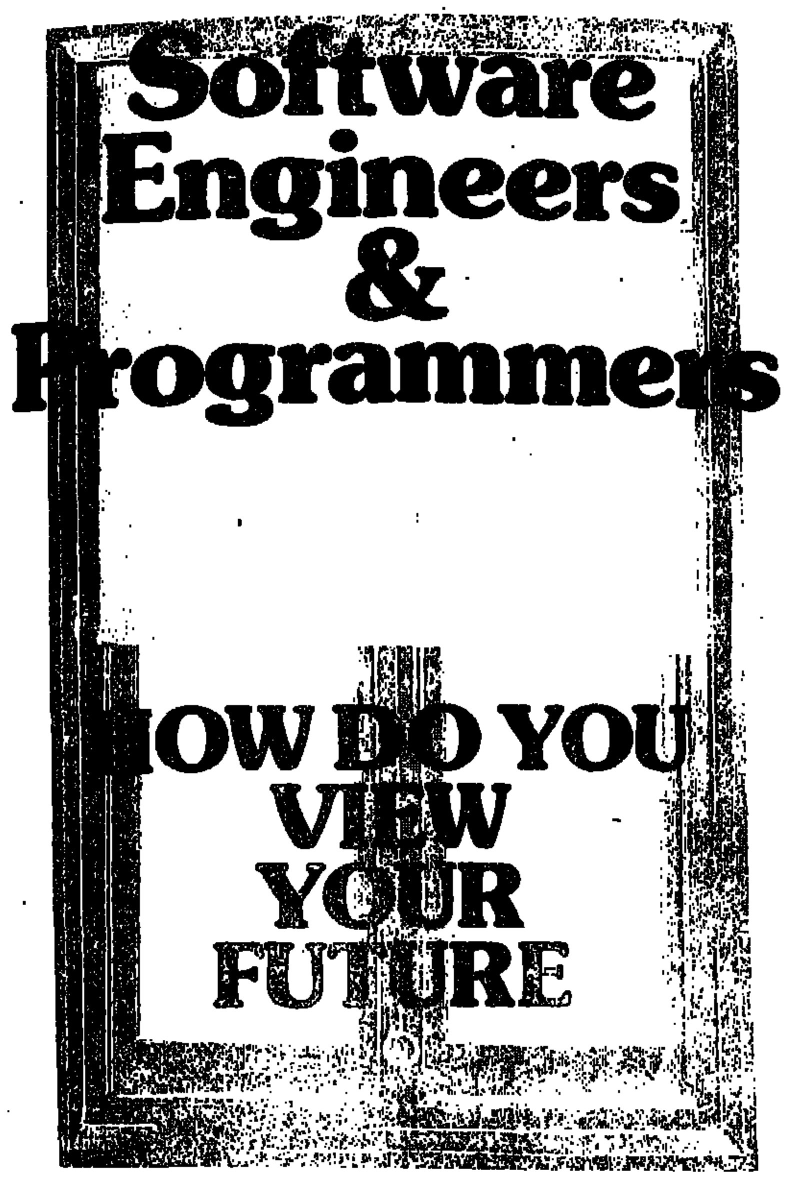
Salary range £5,000-£6,500.

[illegible]

All postions offer a Company Car upon completion of qualifying period plus many other benefits.

Call TERRY WRIGHT on 01-549 8930 now to arrange an interview or write to him at:

Eurologic Software Ltd. 12 Canbury Passage, Richmond Road
Kingston-upon-Thames, Surrey



South Coast

Our Client, one of the leaders in the field of Computer Controlled Traffic and Telex switching systems are *looking* for Software Engineers and Programmers with experience in one of the following:– DEC, PDP11, Central processors, Coral, Macro and real-time programming.
If you have the relevant experience and would like to be an important member of a small team working on Research and Development, why not ring me, John Davey on 01-581 1830 or 01-584 8476, or write quoting reference No. AW5.

Thurloe Executive
30 Thurloe Place, London SW7 2HQ
Telephone 01-584 8476
consultants nationwide

Computer Systems Manager AMSTERDAM

A major financial services organisation seeks an experienced Computer Systems Manager for its new Customer Services Group in Amsterdam.

You will be responsible for providing a range of computing services for this rapidly expanding Group, personally undertaking all systems analysis and programming carried out internally, and making use of external software services when appropriate.

You must either have managed a small E.D.P. unit yourself or now be ready to do so. You should have 2 to 3 years programming and systems analysis experience with a knowledge of ANS COBOL and RPG II. Hardware should include S32/S34 and IBM 370/158. A proven ability to learn languages is desirable.

The successful candidate is offered a five figure salary and first class conditions of employment. Career prospects are outstanding, both as the scope of this position expands rapidly, and elsewhere within the organisation.

Please reply to Richard Varcoe, (quoting Ref. No. 138), showing how you meet the above job specification and including details of your career to date.

Lee Jansen Recruitment Ltd.,
5 Lower Temple Street,
Birmingham B2 4JD.
Manpower Consultants,
Birmingham, London, Amsterdam.

Young Programmers

a challenging career awaits you in

Management Consultancy

up to £5750

City based
World wide travel

First Class training
Excellent prospects

The field of management consultancy offers the rare opportunity to gain exposure to varied problems and techniques on an international basis, while developing the skill in business practice essential for the step into company management.

Our clients are one of the world's foremost international management consultancies — part of a famous firm of chartered accountants, with some 350 offices in 90 countries, they have successfully undertaken many prestigious assignments in the UK and overseas developing systems using the most up-to-date data processing techniques covering a variety of applications for clients in Government, Industry and Commerce.

The Systems Development Group provides a DP consultancy service for the Company's clients throughout the world. As a programmer within the Group, you will gain experience on varied assignments involving:

The design, development and implementation of complex systems;

Computer policy planning, equipment selection and installation;

Feasibility studies and computer efficiency reviews;

DP organisational studies and procedures development.

Ideally you will possess a sound academic background (preferably degree level) and will have gained 1-3 years experience of commercial programming on mainframes or mini-computers. Strength of personality and communication ability will be important factors.

1979 Graduates Our clients also wish to appoint a number of graduate trainees later this year; you should be in the final year of a computer-related degree course and possess the strength of character needed to gain maximum benefit from intensive training and early responsibility.

Future prospects are excellent — assisted by the company's own in-depth training, and external courses, you will be expected to progress rapidly into senior DP consultancy positions, with opportunities to diversify into other fields of business.

If you are seeking a career path to the very top, contact Barry Latchford, quoting ref. BL 2018.

Lloyd Chapman Associates
123, New Bond Street London W1YOHR 01-408 1670

A move to Personnel

for a young DP Specialist
attracted by Recruitment and Personnel Development
London W.6., c. £6,500

A major British group, turnover £800m, has recently formed a Management systems Department incorporating its DP, O & M and Communications function. A DP specialist is required who will be trained in staff selection and career development techniques and take responsibility for providing these services within the department. Candidates, aged 24+, will have a background in systems analysis, programming or operations and ideally be familiar with both main frame and mini computers. Some experience in staff selection or supervision would be useful but aptitude and potential are the essential requirements.

E. Sutton, Ref: 17067/CW.

Male or female candidates should telephone in confidence for a Personal History Form to:
LONDON: 01-734 6852, *Sutherland House, 5/6 Argyll Street, W1E 6EZ.*

Hoggett Bowers
Executive Selection Consultants
BIRMINGHAM, CARDIFF, GLASGOW, LEEDS, LONDON, MANCHESTER, NEWCASTLE and SHEFFIELD.

THE UNIVERSITY
OF LANCASTER

DEPARTMENT OF COMPUTER STUDIES

Applications are invited for the post of

LECTURER

in the Department of Computer Studies. Preference will be given to those candidates with experience of micro-processors.

Salary on the scale £3883-£7754 (under review).

Further particulars may be obtained (quoting reference [illegible]) from the Establishment Officer, University House, Bailrigg, Lancaster, LA1 4YW to whom applications ([illegible] copies) naming three referees should be sent not later than [illegible] May, 1979.

PROGRAMMERS & OPERATORS

FREE LIST
of vacancies to suit you
ALL AREAS
Phone now 01-626 0171

The best CHOICE of Computer Appointments

CHOICE [illegible] 129 Cannon St.
London EC4
Tel. 01-626 0171

Permanent Operators

IBM 370/158 DOS E.C.2
Operator required for a city bank, 2 shifts, ideally 2 yrs. DOS exp. £5000-£6000 a.a.e.

ICL 1902T/2960 George II + Man. S.W.6
2 Senior Ops. Min. 2 yrs. exp. either VME/B 2900 or 1900 George II+. £4000-£4600 + 20% s/a

ICL 2904 E.C.4
Operator URGENT. Very [illegible] 12 mths. + exp. on ICL. £3600 + [illegible] s/a 20%

Call Sally or Elaine on 01-491 4700

Knight

KNIGHT COMPUTER SERVICES LTD.
Staff Services Division of BOC Datasolve, and a member of Computer Services Association.

The University of Leeds

SYSTEMS ANALYST

Applications are invited for the post of Systems Analyst in the Registry of the University. The Administrative Computer Unit provides a general Data Processing Service to most administrative areas in the University

There exists a wide variety of well-established batch systems and it is now intended to develop, on a machine to replace the existing ICL 1901T, new interactive on-line systems and to review, in depth, the nature of the present batch work. This development, on behalf of the Bursar, Librarian and Registrar, will be a challenge and an additional systems analyst is now needed to help meet this challenge.

The successful candidate will play a major part in the detailed design, program specification and implementation of financial and non-financial systems

Candidates should have a sound knowledge of COBOL and a good background in ICL hardware and software. On-line experience and a degree and/or other relevant qualification would be an advantage

Starting salary at an appropriate point on the IA scale for Administrative Staff £3384-£6666 (under review), according to age, qualifications and experience.

Further details of the post may be obtained from the Registrar, The University of Leeds, Leeds LS2 9JT, quoting reference number 119/17/AZ. Closing date for applications 27th April, 1979

Data Preparation Manager

£6847 - £7654

This is an important managerial position within the Central Computer Service of the Greater London Council based at County Hall, near Waterloo Station.

The post involves responsibility for the work of a large Data Preparation section with a staff of 74. An evening shift is also worked with a staff of 12.

The ideal candidate will be of proven managerial ability and have experience of large key-to-disk systems (currently there are 3 x ICL Key edit 100 clusters in separate rooms). He/she will be accustomed to organising the production on time of a very large volume of encoding handled daily.

Benefits include

Over 5 weeks leave a year
plus 1 extra day off per month
flexible working hours
interest-free season ticket loans after 1 year
comprehensive sports and social facilities
restaurants and bars
ideal location - close to transport services and South Bank Arts centre

For further details and an application form contact Paul Hildreth (01-633 3035) or write to Central Computer Service, Greater London Council, Room 296, County Hall, London SE1 7PB. The closing date for applications is 4 May.

GLC Central Computer Service

COUNTY OF SOUTH GLAMORGAN
ENVIRONMENT AND PLANNING DEPARTMENT

SENIOR ASSISTANT ENGINEER

**SO/PO1(1) £5232-£6342 p.a.
inclusive of salary supplement**

The duties of this post in the Research Development Group of the County Surveyor's Division at the County Headquarters will include the use of I.C.L. computers in engineering applications (mainly Highway, Traffic and Structures). Between May 1979 and January 1981, work will be transferred from the I.C.L. 1904S computer to the new I.C.L. 2976. Graph plotting and online terminal facilities are available, most programs being written in FORTRAN and run under the George III or VME/B operating systems. The work consists mainly of the development and implementation of new program suites and the maintenance, enhancement and transfer of existing ones to the new computer.

Applicants should have experience in computer programming and must be chartered Civil Engineers.

A contribution of up to £500 for removal and associated expenses will be considered in appropriate cases.

Application forms from the Personnel Officer, Floor 6, County Headquarters, Newport Road, Cardiff. Tel: (0222) 499022 ext. 3411/2. Closing date 30th April, 1979. (Ref: 5235)

Systems Programming

International Banking Croydon

Bank of America, the world's largest international bank, is seeking a small number of experienced professionals to augment its European Systems Department based near Croydon.

We operate an IBM 360/65 System utilising OS/MFT Operating Systems and have Honeywell H-316 mini-computer systems in branches throughout Europe, Middle East and Africa.

SYSTEMS PROGRAMMERS – Successful candidates will be responsible for data communications and operating systems implementation for the IBM 360/65 and for a variety of mini-computer equipment, and will participate in future systems selection. Applicants should have at least three years data communications programming experience covering IBM 360/370 at the BTAM level. Experience with mini-computer data communications is highly desirable.

PROGRAMMER/ANALYSTS – Successful candidates will develop, maintain and support banking systems run on Honeywell mini-computers. Applicants should have three years programming experience, preferably with knowledge of Fortran. Banking/Accounting experience would be an advantage, as would demonstrated ability to handle user relationships in Europe.

For both positions, occasional travel of short duration in Europe is involved. Excellent career prospects exist within the Bank's international operations. Salaries will reflect experience and qualifications, and other benefits are in line with best banking practice, including non-contributory pension and favourable loan facilities.

Please write in strictest confidence with full personal, salary and career details to:

G L Hope, Bank of America NT & SA, Personnel Planning and Recruitment, 25 Cannon Street, London EC4P 4HN.

BANK OF AMERICA

Systems Analysts

Head Office Edinburgh

We are a major national Group in the brewing and leisure industry with significant interests ranging through Ale and Lager Production, a large Free Trade sales operation, Wines and Spirits, Inns and Hotels, from which we derived a turnover of £390m in 1977/78.

Our Information Services organisation provides a wide range of advanced systems to the Group's operating companies throughout the United Kingdom. These systems run on a 7 megabyte IBM 370/158 with Attached Processor under MVS. A large part of our processing is on-line, with CICS/VS, IMS/VS and VSPC controlling communications and providing database and timesharing facilities.

Additional Systems Analysts are now required to contribute to the implementation of a significant systems development programme covering all aspects of our businesses. Experience of developing on-line and database systems in a CICS or IMS environment is preferred, although training will be given to exceptional candidates who lack these skills. Previous experience in the brewing or hotel industries or a related consumer business will be valued highly.

Open to candidates of either sex, these posts represent attractive career development opportunities to highly motivated individuals ready to realise their potential.

Complementary to competitive salaries, a generous fringe benefits package features non-contributory Life Assurance and Pension schemes and relocation assistance where appropriate.

You are invited to either telephone or write for an application questionnaire to I. M. Gilchrist, Recruitment Manager,
Scottish & Newcastle Breweries Limited, Head Office,
111 Holyrood Road, Edinburgh EH8 8YS. Telephone 031-556 2591 extension 464.

Scottish & Newcastle Breweries Limited

A happy Easter to all our clients and Operators. We're busy hatching some new contracts in the U.K. and Overseas.

For eggzact details see next week's "Top Ops" page in Computer Weekly or telephone 01-491 4706.

Knight

Staff Services Division of BOC Datasolve and a member of Computer Services Association.

University of Birmingham

THE COMPUTER CENTRE

The Centre already provides a wide range of local and remote computing facilities to the University. These are now being further extended by the installation of a DEC 2060 interactive system for both teaching and research and by the development of an internal network which will have links into the Midlands Universities Computing Network.
To help support these extended services applications are invited from graduates for the following posts:

COMPUTER OFFICER
Operations Group

to assist with the management of the DEC 20 installation, to provide technical hardware and software support in the area of telecommunications and overall involvement in the selection, design and construction of specialised hardware.
Candidates should have management ability and several years' proven experience in the design of digital or telecommunications systems

SENIOR HARDWARE ENGINEER
Operations Group

to be responsible for the day to day running of the technical workshop and the construction and maintenance of equipment associated with the network.
Candidates should have practical experience of telecommunications within a computer environment.

COMPUTER OFFICER
User Services Group

to participate in the work of the Group which is responsible for writing and supporting application packages and providing advice, instruction and documentation on the use of the Centre's facilities.
Candidates should be sympathetic to the needs of novice users and preferably have expertise in

statistical data processing

ADVISER FOR INTERACTIVE COMPUTING

This new Computer Officer post has been created in the User Services Group to develop the practical application of

CAI and CAL techniques

The post is tenable for two years: secondment would be welcome. Candidates should have computing experience especially in the areas of simulation and modelling techniques using on-line graphical displays.
For the Computer Officer posts, a higher degree is desirable but in all cases clear evidence of previous work successfully completed is essential.
Starting salary for Computer Officers, according to age, qualifications and experience, will be on the scale:
£3384-£5604 (bar) — £6555 (under review)
and for the Senior Hardware Engineer on the Other Related 1A scale:
£3883-£6555 (under review).

Further particulars are available from the Assistant Registrar, Science and Engineering, University of Birmingham, P.O. Box 363, Birmingham B15 2TT, to whom application (three copies), including full curriculum vitae and naming three referees, should be sent by Wednesday, 2nd May, 1979. Please quote ref. C23.

An opportunity to join a young, energetic and forward thinking team of engineers at the Digital Technology Centre of Plessey Communications & Data Systems Limited, Lenton, Nottingham.

Mini & Micro Processor Software Engineers

– preferably with a degree or equivalent in Computer Science/Engineering/Maths/Physics. Experience in assembler programming would be an advantage.

There are also some opportunities for

Fortran Programmers

– preferably with a science degree or equivalent. Some knowledge of Data General systems would be useful but not essential.

Competitive salaries will be negotiated on the basis of experience and qualifications. Large company benefits include generous help with relocation expenses.

We're around three miles from the centre of Nottingham – enjoying all the amenities of a big city and attractive countryside.

The area offers a wide range of reasonably priced housing – plus first class road/rail links to London and the North.

Join us now...

Contact Roger Andrews, Software Engineering Manager, on Nottingham (0602) 866522 Ext 201 between 10am – 8pm. Please reverse charges. Alternatively, write to him at Digital Technology Centre, Plessey Communications & Data Systems Limited, Abbeyfield Road, Lenton, Nottingham NG7 2SZ.

PLESSEY

Principal Computer Operator

Philips Research Laboratories require an experienced Operator to join a small team in the Computer Department

The Department runs a computing service for scientists and engineers involved in many varied areas of research. It is based on two ICL 1904S processors, using a special version of George III which allows both to access the same file store. A DIGICO 1603 front end connects 38 terminals. Later in 1979 an SEL 32 computer system will be installed to do CAD of integrated circuits.

The person chosen will be involved in all usual aspects of operating, and will also be required to assist and deputise for the Chief Computer Operator in organisational and technical matters. Consequently, several years' 1900 and George III experience are essential together with a technical knowledge of communications equipment. The ability and flexibility to learn about new systems is also needed.

A five-day week is worked, normally 8.30 a.m. to 4.30 p.m. with shift hours (5 times in two weeks) from 2.00 p.m. to 10.00 p.m.

Please apply to. **Mr M. L. Malpass, Philips Research Laboratories, Cross Oak Lane, Salfords, Redhill, Surrey. Telephone: Horley 5544.**

Research Laboratories **PHILIPS**

THE POLYTECHNIC: WOLVERHAMPTON

The Polytechnic is establishing a Computer Centre to be responsible for computing facilities and services. A large dual PRIME 500 interactive system supporting initially 64 terminals and a batch load will replace the existing ICL 1903A service in mid 1979. Additional computer staff are required and applications are invited for the posts of:

SENIOR ANALYST/PROGRAMMER

(Scientific) £5232-£6060

To be responsible for the scientific and engineering areas of Computer Centre activity. Candidates should have several years' experience in these and user support areas, be able to undertake program and system development and co-ordinate small project teams.

A knowledge of packages such as PAFEC, SPSS, NAG or GINO would be an advantage.

SENIOR ANALYST/PROGRAMMER

(Commercial) £5232-£6060

To be responsible for the commercial/administrative areas of Computer Centre activity. Candidates should have several years' experience in these and user support areas, be able to undertake program and system development and coordinate small project teams.

PROGRAMMERS

£3732-£5073

Applicants should have a sound computing background and experience in applications or systems programming.

Further details and application forms from Personnel, The Polytechnic, Wolverhampton WV1 1LY.
Telephone — Wolverhampton 27371.

UNIVERSITY OF KEELE

SYSTEMS PROGRAMMER

In Computer Centre

Applications invited for a Systems Programmer in the Computer Centre.

The University computing service is based on a GEC 4080 interactive computer, two PDP 11s, a CTL Modular One satellite linked to UMRCC and Liverpool and an ICL 7905 processor which links Keele to the North West Universities Network. The Centre has major commitments in networking, in interactive computing and in the development of microprocessor applications.

Salary scale (Other Related) Grade 1A/II — £3883-£7754 per annum (efficiency bar £6555 per annum) (under review). The appointment will be on the first three points of the scale (£3883-£4362).

Application forms and further particulars from the Registrar, The University, Keele, Staffs, [illegible]. Closing date — 30th April, 1979.

CMG
London · Amsterdam · Frankfurt
Rotterdam · Brussels · Glasgow

Computing Services Association

Consultants Analysts Programmers

Enjoy variety of work plus probably the best benefits package in the industry

The recent Jordan Survey on Britain's Top 500 Electronic Companies showed that CMG COMPUTER MANAGEMENT GROUP is the highest payer in the computer industry (front page Computer Weekly, 1st February, 1979) – but the benefits of working for CMG go much further than that.

CMG is now the largest independent computer services bureau in Europe. Privately owned by the employees, its unique style of management, and employee participation has generated vigorous growth which has tripled annual turnover to £12 millions in the last four years. It goes without saying that in this environment there are ample opportunities for career advancement.

We are seeking systems people for a variety of work solving commercial business problems using minis, mainframes and terminals, from programming to consultancy. You will need a minimum of 2 years experience in commercial systems and programming.

Salaries: £5,000 - £13,000 P.A.

Plus,

- Profit share up to 10% of salary
- Non-contributory pension
- Free Life Assurance
- BUPA Family Cover
- *21-26 days annual holiday*
- *Assistance with removal expenses.*

Locations: London, City, Greenford, Croydon, Glasgow.

Please contact Caroline Connabeer quoting reference no. CMG014.

Technical Support People Ltd.
Victory House, 99 Regent Street,
London W1R 7HB
Telephone: 01-734 9776

Computer Operator

Ford Motor Company - Langley

The Truck division at Langley currently operates a Burroughs 2700 machine under MCPV basically on batch processing but can cover some communications support. We will be upgrading our machine to the new 2815 model in the near future to give us a configuration of 120 M.B. of disc, 2 x 80 K.B. tape units, 1100 L.P.M. printer and 250 K.B. of core. Future applications will consider on-line direct entry stations within the plant and remote processing to an IBM mainframe at the company's headquarters at Warley, Essex.

A Data 100, model 70, is also on site.

Shift working is essential and is reflected in the salary offered of up to £5,500. Opportunities for advancement are considerable within the company's growing Data Processing organisation. Ideally the prospective candidate should have had Burroughs Medium System operating experience for a minimum of one year. Normal large company benefits are in existence including an attractive car purchase scheme.

If you think you would like to join a growing team, please write to Joe Vickers, Room 37/110A, Ford Motor Company Limited, Sutton Lane, Langley, Berkshire.

Ford

oxford polytechnic

Department of Mathematics Statistics and Computing

Senior Lecturer or Lecturer II in

Data Processing

A vacancy exists for a person to teach Data Processing on HNC, HND Computer Studies courses and on the Modular degree course. An interest in Data Base, Communications, Networks or Distributed Processing area would be an advantage. Candidates should have a higher degree and relevant industrial/commercial and teaching experience.

Department of Management and Business Studies

Senior Lecturer or Lecturer II in

Data Processing

(temporary appointment for one year)
To be responsible for teaching this subject to Degree and Diploma courses.
Salaries:
Senior Lecturer £6,051-£7,005 (bar) — £7,572
Lecturer II £4,101-£6,558
Under review from 1 April 1979
(transfer from Lecturer II to Senior Lecturer is, subject to efficiency requirements, automatic)
Applications, including a curriculum vitae and the names of three referees, should be sent by 15 May, 1979, to the appropriate Head of Department, **Oxford Polytechnic, Oxford OX3 0BP**, from whom further particulars and application forms may be obtained.

The POLYTECHNIC WOLVERHAMPTON

Computer Centre

The ability to lead and innovate?

We require a Head of Department for our new Computer Centre with the ability to lead and innovate. This opportunity is a result of the installation of one of the most advanced computing systems in a Polytechnic.

Applicants should have a substantial computing experience in Education/Industry/Commerce.

Salary within a range of £8600 - £9600 (Burnham Grade 5 or P.O.2 (f) + 5) (re-advertisement, previous applicants still being considered).

Application form and further details from:
'Personnel', The Polytechnic, Wulfruna Street,
Wolverhampton WV1 1LY.

Contract Requirements

IBM OS COBOL + IMS	KENT
IBM/VENTEK Sys. Prog.	N. LONDON
ICL COBOL —	SURREY
HONEYWELL COBOL + IDS —	N. LONDON
PDP FORTRAN A/P	HOLLAND
PDP BASIC +2	HOLLAND
INTEL 8080 ASSEMBLER	GERMANY

Call Richard or Suzy on 01-491 4706

Software Division.

Knight Staff Services Division of BOC Datasolve and *a member of Computer Services Association.*

Computer Operators

£3600-£4800 (inc. Shift Allowance)

The Society is seeking applicants in the age group 20-35 years who have gained a minimum of four GCE 'O' level passes including Maths and English Language. The successful applicant will have at least 18 months experience of working in a Computer Operations environment and will form part of a team manning the Society's new UNIVAC 1100/80 series machine installed in its Computer Centre in the Baker Street area of London.

The position will entail shift work for which a substantial allowance is paid. Other benefits include modern catering facilities, contributory pension scheme, BUPA membership, life assurance and special staff mortgage facilities.

For application form write to:

D. L. Howard, Senior Personnel Officer, Personnel Department,
Abbey National Building Society, 27 Baker Street, London W1.

ABBEY NATIONAL

Easter Holiday

CLASSIFIED COPY

Advertisements for the following issue should be sent as early as possible.

April 19th

Bulk of copy by 4 p.m. Thursday, 12th April
latest by 11.30 a.m. Tuesday, 17th April

Your help and co-operation will be very much appreciated, further details can be obtained from ... David Abbey, 01-261 8018, Telex number 25137.

University of Birmingham

Applications are invited for the post of

COMPUTER OFFICER

in the Centre for Computer Studies in the Medical School. Applicants will normally hold an Honours Degree or equivalent qualification, and should have at least five years' relevant scientific and commercial computing experience, preferably in medically related areas. They should be fluent in Fortran, Basic and Assembly level programming.

The successful candidate will be responsible for the systems analysis, design, programming and implementation of a wide variety of projects originating in the Medical School and Area Health Authority, and will generally assist in the Centre's activities.

Salary is on the other related staff scale 1B (£3384-£5604) or 1A (£3883-£6555) according to qualification and experience. USS benefits.

Applications, giving the names of three referees, should be sent by 7th May, 1979, to the Assistant Registrar, the Medical School, Birmingham B15 2TJ. Further particulars from the Director of the Centre at the Medical School. Please quote ref.: COCW.

WARRINGTON BOROUGH COUNCIL
BOROUGH TREASURER'S DEPARTMENT

1. PRINCIPAL COMPUTER ASSISTANT

PO1(6-9) (£6,342-£7,044)

2. SYSTEMS ANALYST/PROGRAMMER

(2 posts) SO1/2 (£5,232-£6,060)

both salaries inclusive of supplements.

Applications are invited for the above posts in the Computer Section of the Borough Treasurer's Department.

The post of Principal Computer Assistant is second in charge in the Computer Section

Duties will involve the leadership of a team of Systems Analysts and Programmers and ensuring, in the absence of the Computer Manager, that all aspects of operations are carried out effectively.

Applicants will be expected to possess good team leadership qualities and have several years experience in systems analysis and programming work

The possession of a degree or other relevant qualification would be advantageous.

The analyst/programmers will be required to assist in the development of new systems and the maintenance of current applications.

At least three years' experience of COBOL programming is essential and some experience of systems analysis would be desirable.

The Council's computer is an ICL 1901T which is currently running a wide range of financial and technical applications with on line interrogation facilities being provided on a number of systems.

Plans have been made to instal an ICL 2950 computer in October 1980. **Application forms and job descriptions for the above posts may be obtained from the Personnel and Management Services Officer, Warrington Borough Council, *Town Hall, Sankey Street, Warrington*, to whom they should be returned by 27 April, 1979.**

Institute of Basic Medical Sciences

(British Postgraduate Medical Federation and Royal College of Surgeons of England)

Applications are invited from Science graduates and/or other appropriately qualified persons for the post of

PROGRAMMER/ TERMINAL SUPERVISOR

for a PDP-11 Remote Job Entry Terminal which is being installed at the Institute, *as part of the University of London's computer network*

Salary within the scale £3 883-£5,604 plus £502 p.a. London Weighting. (University of London Scale 1B — award pending).

Further details from the Secretary to whom completed applications should be made by 27th April, 1979.

Institute of Basic Medical Sciences
Royal College of Surgeons of England
Lincoln's Inn Fields
London WC2A 3PN

NEWCASTLE UPON TYNE POLYTECHNIC
Chief Administrative *Officer's Department*

SYSTEMS ANALYST (ADMINISTRATION)

To be responsible for the design, development and maintenance of computer based information systems and related Management Services in connection with the Academic, Personnel, Financial and General Administrative activities of the Polytechnic.

Candidates, who should be professionally qualified and experienced analysts with an administrative background, will be expected to have particular experience in the design of planning and management control systems.

Resettlement expenses are payable in certain circumstances and a flexitime scheme is in operation.

N J C. salary and conditions P.O.1 (points 1-8): £5727-£6342 p.a. including supplement.

For further particulars and application form, returnable by Wednesday 18th April, 1979 please send a stamped addressed foolscap envelope to the Staffing Officer, Newcastle-upon-Tyne Polytechnic, Ellison Building, Ellison Place, Newcastle-upon-Tyne NE1 8ST.

PROGRAMMERS

Gould Computer Systems, one of the largest service companies in the Midlands, is seeking both junior and senior levels of programmers to meet its continual market expansion.

Junior levels — £4,000 to £5,000
Senior levels — £5,000 to £6,500

Apart from a variety of interesting projects, we offer:

★ A realistic salary.
★ 4 weeks' paid annual holiday.
★ Paid overtime.
★ Travelling expenses.
★ Paid travelling time (where applicable).
★ Company car and extra holiday (after period of service).
★ Active involvement in the growth of the company.
★ Working for a personnel orientated company.
The opportunity to participate in various social activities.

Can you utilise your skills more effectively? Find out by ringing Dave Wallis or Roger Radford on our Birmingham number (Evening: Dave Wallis on Leicester 865626).

Gould Computer Systems Limited

Fifth Floor
Scala House
Holloway Circus
Birmingham 1
Tel: 021 643 5118/9

PROGRAMMERS

A lucrative and secure future in Western Germany

We are: The leading bakery product manufacturer and producer in Germany and are based in Pfungstadt (between Frankfurt and Heidelberg).

We have: An ICL 1903 A, 96 K, 4 EDS60, 4 MT, 2 printers, document reader and plan to change to new generation equipment by the start of 1981.

We need: Programmer(s) who can handle ICL-equipment, GEORGE TPS and COBOL and who is willing to learn German

We offer: Salary of around £10,000 p.a. with excellent prospects as well as other fringe benefits. Relocation expenses are, of course, being taken care of by the company

If you are interested please contact:

Wilhelm Weber GmbH Backwaren
Ostendstr 8
6102 Pfungstadt
West Germany
Phone number: 01049-6157-3061

Sending a CV and giving dates and/or times preferred for interview, which will take place in May 1979, in London.

South West Thames Regional Health Authority
Tooting, London SW17.

SENIOR COMPUTER OPERATOR

£5659*

Applicants with a thorough knowledge of George 3 and a high standard of technical expertise are invited to apply for this position, which will develop those with supervisory and/or management potential in ICL 1900 operations. The expanding ICL 1903T installation is shortly going to a 3 shift system, under George 3 and MOP.

DATA PREPARATION MANAGER

£4775

For a small established and active CMC 5200 twin Key-to-Disk System, with 22 key stations. The manager is responsible for planning and control of the workload, and control of outside bureau facilities.
CMC experience is preferred, but technical training will be given to those with management or supervisory experience of other systems.

SALARIES CURRENTLY UNDER REVIEW.

For further details, 'phone Sylvia Lyons or Les King, up to 8.00p.m. each evening, or write to:

Modem Computer Services Limited,
FREEPOST, London WC2N 5BR. 01-839 3351.

*Includes shift allowance and London Weighting.

MODEM
Data Processing Staff Consultants

Ireland - a small move to a bigger future

Two Systems Analysts

Aged 25-30 £5,500-£7,500 + benefits

For the subsidiary of a well-known UK food processor.

The Systems Analysts will report to the Systems Manager and function as Project Leaders. You must have several years' experience in D.P. and systems analysis and also be conversant with marketing, financial and production systems. SAT/318/CW.

DP Manager

c. £10,000 - West of Ireland

Responsible for a number of installations. Ideal applicant should have good technical background in mini systems as well as proven managerial experience in the D.P. function. Experience with micros an advantage. DP/319/CW.

Systems Designer

c. £8,000 + Relocation expenses

The holding company of a large construction group wishes to recruit a Systems Designer.

You will have several years' experience in the design and implementation of project estimating, budgeting or control systems for large construction projects. You will be expected to take responsibility for clients in the Group who are primarily contract managers for major construction projects. SD/320/CW.

Systems Manager

Age around 30 c. £9,000 + benefits

For the subsidiary of a well-known UK food processor. The Systems Manager will report to and deputise for the Head of Computer Services and will be actively involved in formulating and implementing the data processing forward plan.

You will also act as business analyst identifying those areas in the company where D.P. can be applied most profitably.

Ideally you will have a minimum of five years' experience in D.P. plus three years in systems analysis, preferably gained in a System 3 environment with R.P.G. and experience of on-line applications is desirable. You will be throughly conversant with marketing, financial and production systems. SM/321/CW.

Analyst Programmer

Mid 20's Competitive Salary + benefits

A multi-national petroleum company using an IBM 370 seeks an Analyst Programmer in their mid 20's with several years COBOL experience.

You will work on a wide variety of applications, including on-line, and should therefore have an in-depth programming and systems experience.

A very competitive salary plus attractive fringe benefits will be paid to the right person. AP/322/CW.

Systems Analyst

c. £6,500 + Travel Allowance

A large organisation in the food processing industry is looking for a Systems Analyst with R.P.G. 2 and System 3 experience. Mid to late 20's.

The company is embarking on a range of interesting projects including on-line systems. Training, where appropriate, will be given and a generous travelling allowance will be paid. SA/323/CW.

Trainee DP Consultants

c. £6,000

A major international firm of management consultants seeks trainee D.P. Consultants aged 25-27 with several years' distinguished work experience, preferably in data processing.

Salaries are negotiable for candidates of graduate standard. Training will be given in Ireland, Geneva and Chicago. Career and salary progression within the firm will be rapid for people of the right calibre. DPC/324/CW.

In all the above appointments our clients will in appropriate cases give assistance with relocation expenses.

Write with career details to date, or telephone for an application form, quoting appropriate reference number, to Benton & Bowles Recruitment, 197 Knightsbridge, London SW7. Telephone 01-589 1444. Please list separately any companies to which your application should not be forwarded.

If these posts do not exactly suit your training and experience, please write anyway, and we can consider you for other similar vacancies in Ireland as there is a continuous demand.

B&B Benton & Bowles Recruitment
B & B Recruitment Limited, 197 Knightsbridge, London SW7.

in association with

Computer Staff Recruitment Ltd. CSR Dublin

T.P. Co-ordinator

Salary £4245-£5073 including supplement

We are seeking a man or woman for this post based at County Hall, Exeter. You should have experience in Teleprocessing, OS VS1, CICS or TASKMASTER and OS JCL. Responsibilities will include the day to day control of the Council's TP systems, liaison with users and suppliers and the provision of statistical information. Involvement in other aspects of technical support work will be expected. An enthusiastic approach and the ability to see, and get on with, what needs to be done are essential qualifications for the post.

The Authority currently runs a 1 MB I.B.M. 370/148 operative under OS VS1 and TASKMASTER. Conditions of service include a 37 hour week with flexible working hours; 21 days' annual leave; staff restaurant and social club.

Application form from the Assistant County Treasurer (Computer), County Hall, Exeter. Tel. (0392) 77977 Ext. 2472, returnable by April 27th, 1979.

DEVON

SYSTEM ANALYST — PROGRAMMER

(c £6,000) CENTRAL BIRMINGHAM

Candidates with a minimum of two years' experience of COBOL or Fortran are invited to apply for the above position within a large market research company. Flexible working hours, interesting On-Line Development applications together with a small friendly D.P. team provides the ideal environment for career progression.

For further information please telephone or write to:

Mr. M. E. Whale
Statts M.R. Company Limited
Gloster House, Small Brook
Queensway, Birmingham. Tel. 021-643 8972

THE UNIVERSITY OF LEEDS

DEPARTMENT OF APPLIED MATHEMATICAL STUDIES

Applications are invited for the post of

COMPUTER OFFICER

in *Applied Mathematics. The duties of* the Computer Officer will include (1) provision of assistance in computing to undergraduate and postgraduate students, and to staff members, (2) the conduct of an independent line of personal research. Candidates should possess (or should expect shortly to possess) a Ph.D in some branch of science or engineering relevant to the Departmental interests, which lie mainly in the fields of continuum mechanics, astrophysics, mathematical physics, and numerical analysis. The appointment will be made for a fixed period of three years.

Salary at an appropriate point on the IA scale for Research and Analogous Staff (£3883-£6555) (under review), according to age, qualifications and experience.

Further information on this post can be obtained from the Head of Department, *Professor* D. G. Crighton (0532 31751, ext. 7304).

Application forms and further particulars may be obtained from the Registrar, The University, Leeds LS2 9JT, quoting reference number 51/4/aZ. Closing date for applications 4 June, 1979.

PLYMOUTH POLYTECHNIC

SCHOOL OF MATHEMATICAL SCIENCES

PRINCIPAL/ SENIOR LECTURER/ LECTURER II IN COMPUTING

Applicants should have a good honours degree together with teaching, research or practical experience in commercial data processing and/or systems analysis. The grade of appointment will depend on the qualifications and experience of the candidates.

	Salary:
PL	£7047-£8544
SL	£6051-£7572
L II	£4101-£6558

Application forms to be returned by 4th May, 1979 can be obtained with further particulars from The Personnel Officer, Plymouth Polytechnic, Drake Circus, Plymouth PL4 8AA or phone on 264639 or 21312 ext. 5174.

UWIST

University of Wales

CIVIL ENGINEERING AND BUILDING TECHNOLOGY

RESEARCH ASSISTANT (COMPUTER PROGRAMMER)

Duties will include programming on a range of research and teaching projects. Prior experience in civil engineering NOT required. A part-time appointment could be considered.

Range 1B £3384-£4882.

Requests (quoting Ref. CW) for details and application forms to Personnel Section (Academic), UWIST, Cardiff CF1 3NU.

Closing Date: 25 May, 1979.

UNIVERSITY COLLEGE HOSPITAL AND MEDICAL SCHOOL

BASIC GRADE SCIENTIST

(Computing)

Department of Medical Physics and Bio-Engineering

Applications for this post are invited from honours graduates in science preferably with a qualification in computer science. The successful candidate will join the Computer Science Group of the Department which provides scientific computing support to the Hospital and the Medical School. The group operates a range of both real time multi-tasking and dedicated PDP 11 based computer systems. The successful candidate will be required to assist in the development of a suitable network structure and protocol for linking the various machines, and in maintaining and developing a series of system utilities for applications packages.

Further particulars may be obtained from the Director of the Department, 11-20 Capper Street, London WC1E 6JA.

Salary scale £3,840-£[illegible] including London Weighting.

Application form and job description from [illegible], Personnel Department, University College Hospital, Gower Street, London WC1E 6AU, quoting Ref. [illegible].

Reinsurance

We are Greig Fester — a leading independent group of reinsurance brokers, based in the City of London.

We have recently installed our first computer — an ICL System Ten — and in conjunction with Dataskil are developing a management information and accounting system, the first stage of which is currently being implemented.

We are now looking for an experienced systems analyst/programmer to manage the existing set-up and to be responsible for future development. Such development could *include involvement with word processing systems, further* distribution of the existing system etc.

Applicants, probably in their mid-twenties to early thirties, should preferably have experience of small systems, and a knowledge of insurance or reinsurance would be a distinct advantage. A knowledge of basic O&M techniques would also be useful.

Salary will be negotiable together with other benefits commensurate with this level of appointment, including a company car at an early date.

This is a unique opportunity for a person who likes to work with a fair degree of autonomy and is capable of becoming an integral part of a professional management team.

Applicants are invited to write, enclosing a curriculum vitae, to Michael Simmonds, FCA, Greig Fester Limited, Regis House, 43/46 King William Street, London EC4R 9AD.

ANALYST PROGRAMMERS

required for interesting projects in and around the London area. Applicants should have COBOL, BASIC or RPG II experience on business systems. Excellent salary commensurate with experience.

Apply: P. R. Daly & Co. Ltd.
Butts Mead, High Road Eastcote, Pinner, Middlesex

SPRING AHEAD WITH EFFECTIA GRAVIS

SYSTEMS DEVELOPMENT VACANCIES

Systems Analyst Some COBOL/Programming	**c£7000**	Surrey Ref. L2981
Senior Programmer COBOL/Systems Design	**£6700**	City Ref. M2982
Programmer COBOL	**c£5750** Travel co	Herts Ref. B2945
Programmer OS COBOL	**£6000** + car	Middx. Ref. B4921
Systems Programmer BAL-JCL	**c£6500**	Staffs Ref. C3006
Programmer RPGII	**c£5000** + Mort	City Ref. C3005
Programmer Cobol/Algol	**£7800**	E. Anglia Ref. C2854
Analyst Programmer COBOL-CORAL	**£7000**	Leeds Ref. B2856
Project Leader 3/4 years' Design	**£7500** + car	West London Ref. M3048
Programmer 1 year + BASIC	**c£5000+**	North London Ref. L3053
Programmer 3 years' + COBOL/2904	**£6000**	City Ref. M3037
Chief Programmer 2900/COBOL	**c£8000**	South Coast Ref. L3046
Analyst Programmer 2900/PLAN	**£6500**	City Ref. M3038
Programmer 12 months + COBOL	**c£5000**	City Ref. L3035
Systems Analyst IBM/On-line exp. (Commercial	**to £7000**	Surrey Ref. B3060
Programmer Analysis Training COBOL	**to £6000**	N. Surrey Ref. C3061

CONTRACT VACANCIES URGENT

[illegible] GIII	South London Ref. [illegible]
ICL Operators VME	South London Ref. [illegible]
ICL Operators GIII	North London Ref. [illegible]
IBM Operators DOS	East London Ref. [illegible]

The following Contracts are [illegible] within the next four weeks.

IBM Operators DOS	Bucks Ref. [illegible]
IBM Operators OS	Essex Ref. [illegible]
ICL Operators [illegible]	Herts Ref. [illegible]
IBM Operators Data 100	South London Ref. ME110
IBM Operators Sys 3	North London Ref. [illegible]
Honeywell Operators GCOS	East Anglia Ref. [illegible]
Data Preparation VDU, Cards, Key to Disc	All London areas Ref. [illegible]

If you have 2 years + OPERATIONS experience, and are a freelance operator (or intend to go freelance in the near future), contact us for full details of our current and forthcoming contracts.

REMEMBER, we pay excellent rates (and expenses) to our contractors.

OPERATIONS VACANCIES

Operations Manager DOS/VS SHADOW/DL1	**to £8000**	Herts Ref. B3020
Senior Operator DOS/VS POWER/VS	**c £5000**	City Area Ref. B3025
Senior Operator 2900/DME	**£5000**	Hampshire Ref. M2768
Senior Operator 2903/4	**£5000**	Surrey Ref. L2994
Operator 1900/GII+	**£4500**	West London Ref. M2962
Senior Operator OS/VS1	**c £5000**	Middx Ref. C2924
Senior Operator DOS/VS POWER/GRASP	**c £5000**	Essex Ref. C2996
Shift Leader OS/VS	**c £5500**	London Ref. B2946
Shift Supervisor 2900/DME	**£5000**	Herts Ref. M3027
Operations Controller 2900/VMEB	**£5700**	S. Coast Ref. L3045
Experienced Operators 2903/JCL	**£5000**	S. Coast Ref. M3034
Senior Operator System 3, 2 shifts	**to £5000**	N. London Ref. B2879
Shift Leader DOS/VS POWER/VS	**to £5000**	N. Surrey Ref. B2811
Ops./Senior GCOS/OS 2000	**to £4500** + reloc.	Lancs Ref. B2814
Computer Manager RPGII/2903	**c£6000** + reloc.	East Sussex Ref. M3051
Operators GIII/VME	**£4000+**	Middx. Ref. L3049

Licence No. SE(A)62

EFFECTIA GRAVIS
Personnel Consultants
01-439 6481
National House
56 Wardour Street
LONDON W1V 3HP

Licence No. SE(A)62

EFFECTIA GRAVIS
Personnel Consultants
01-439 6481
National House
56 Wardour Street
LONDON W1V 3HP

Licence No. SE(A)62

EFFECTIA GRAVIS
Personnel Consultants
01-439 6481
National House
56 Wardour Street
LONDON W1V 3HP

COMPLETE AND RETURN TO **EFFECTIA GRAVIS NOW** (BLOCK CAPITALS PLEASE)

Name (in full) ....

Address (Permanent) ....

....

Telephone: Home .... Office ....

Type of Transport .... Date of Birth ....

Current Position (Contract/Permanent) delete .... Salary/Rate ....

Position Required (Contract/Permanent) delete .... Salary/Rate ....

Notice Required/Date Available (delete) ....

Areas Preferred: First Choice .... Second Choice ....

Experience to date: (Last Position First)

Company: Name and Location	From Mth/Year	To Mth/Year	Duties and experience

Date .... Signature ....

Reg. No.
DATE
CW/[illegible]

Whatever level you have reached in the Computer Industry, you wouldn't be human if the chance of bettering yourself wasn't taken.

Does one or more of the following apply to you?

1. Looking for a new contract?
2. Seeking a more responsible permanent [illegible]
3. Require a more lucrative contract?
4. Want to be financially rewarded for [illegible]

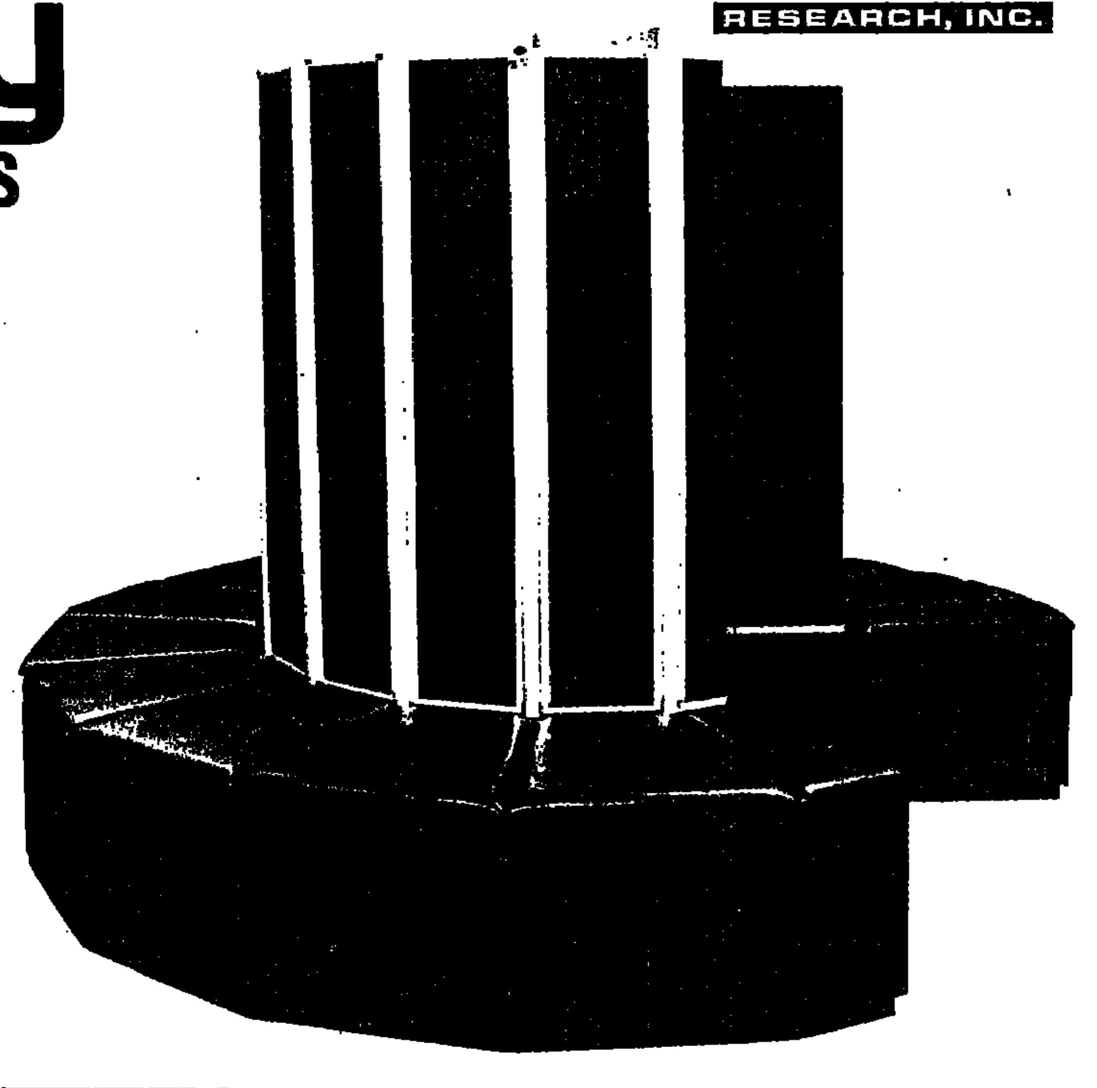
[illegible]

William Key

CUSTOMER SERVICE ENGINEERS

for the fastest computers in the West!

CRAY RESEARCH, INC.



Cray Research (UK) Ltd. now has vacancies due to the continued growth for Senior Technical Customer Engineers. These posts entail in-depth site maintenance of the Cray mainframe plus its associated peripherals, together with additional technical responsibility.

Applicants should have previous mainframe experience and the ability to fault find to component level under their own initiative. Shift work and overtime are envisaged.

These jobs are primarily based in the Reading and Manchester areas with the possibility of European travel.

Product training will be given to successful applicants, a portion of which will be in the U.S.A.

These posts carry good salaries, together with a Company car and an excellent benefits package. So if you're interested in joining a rapidly growing world leader in computing —

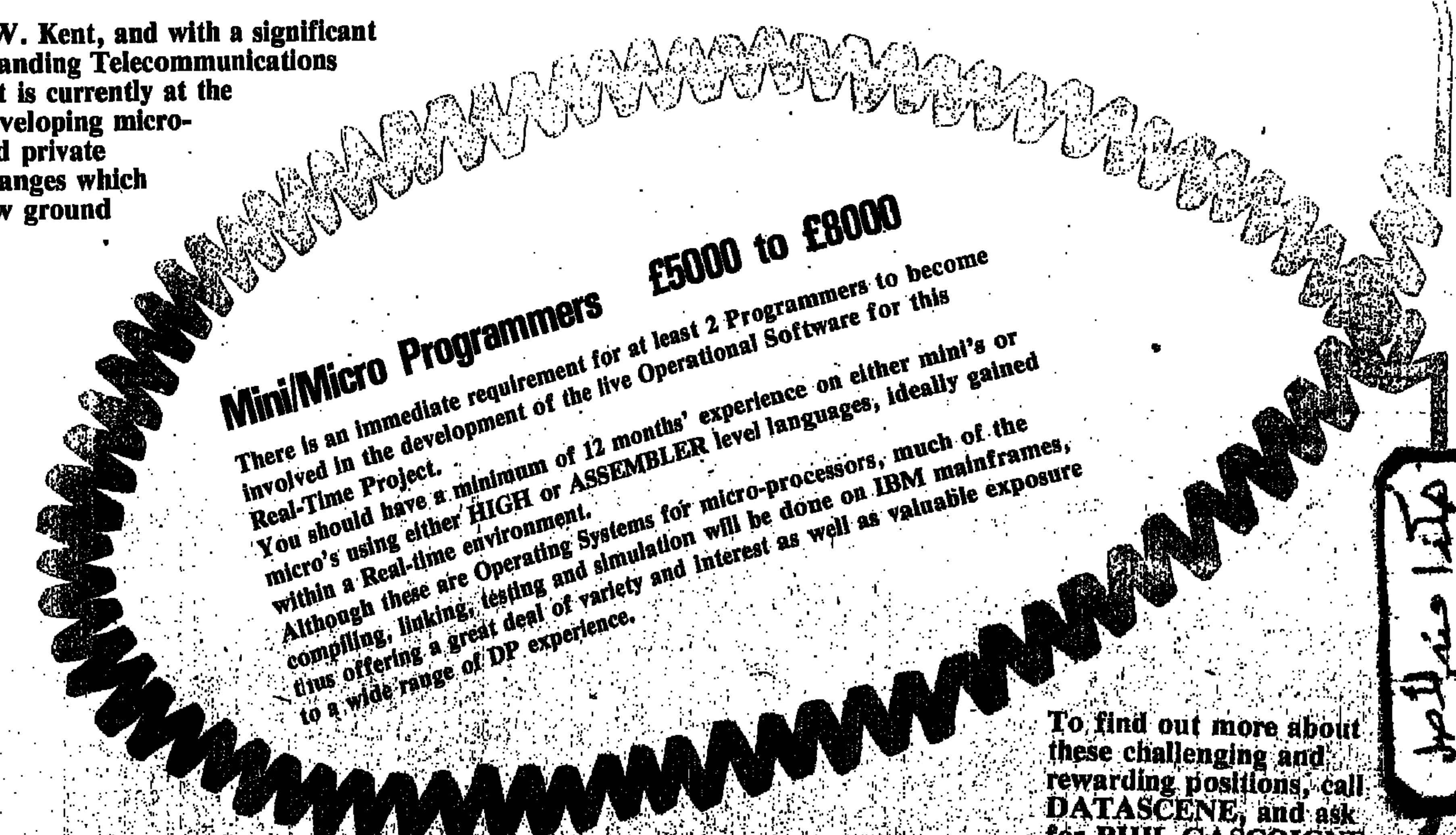
Telephone Stuart Drayton on BRACKNELL (0344) 21515 (day) or Richard Bulgin on 01-493 2947 (day) or RICKMANSWORTH 76143 (evenings/weekends), or forward a C.V. to him, Ref. CW9743, William Key & Partners, Freepost 4, London W1E 8UZ.

WILLIAM KEY & PARTNERS, 4 HALF MOON STREET, W1
(Computer Staff Consultants)

STOP PRESS!

Other opportunities — Substantial Salary + CAR
SALES EXECUTIVES (Ref. CW 9745). SYSTEMS PROGRAMMERS (Ref. CW 9744)
INSTALLATION PLANNING ENGINEERS (Ref. CW 9746)
INSTRUCTORS Software/Hardware (Ref. CW 9747)

Situated in N.W. Kent, and with a significant lead in the expanding Telecommunications field, our client is currently at the forefront in developing microprocessor based private telephone exchanges which will broach new ground in many areas.



Mini/Micro Programmers £5000 to £8000

There is an immediate requirement for at least 2 Programmers to become involved in the development of the live Operational Software for this Real-Time Project.

You should have a minimum of 12 months' experience on either mini's or micro's using either HIGH or ASSEMBLER level languages, ideally gained within a Real-time environment.

Although these are Operating Systems for micro-processors, much of the compiling, linking, testing and simulation will be done on IBM mainframes, thus offering a great deal of variety and interest as well as valuable exposure to a wide range of DP experience.

To find out more about these challenging and rewarding positions, call DATASCENE, and ask for PHIL GASCOIGNE.

Datascene Recruitment Ltd
Sceptre House
169–173 Regent Street
London W1R 7FB

datascene

01-439 7871
24 hour answer phone

A UNIQUE OPPORTUNITY!

SENIOR PROGRAMMER ANALYST

£5500 plus

south yorkshire

- ✱ New Installation
- ✱ On Line Systems.
- ✱ Scope for Creativity

Our Client is an expanding manufacturing company with a reputation for innovation and high standards, whilst still maintaining an informal and cordial management style.

It is not surprising, therefore, that the Data Processing Department is deliberately being developed along the same lines to encourage the individual to make the maximum professional contribution. The successful applicant will join a small high quality team and be involved in projects from the initial design stages through to successful implementation, thus offering a high degree of job satisfaction.

The computer shortly to be installed is a Data General Eclipse C350, which will have a 512K byte CPU, a 600 LPM Printer, 192 Megabytes of Disk Storage, Magnetic Tape and an initial terminal array of 4 Units which will grow to 25 Units. Program development will be in Cobol and Idea.

The systems to be developed will be interactive. They initially cover Financial Ledgers, Order Entry, Despatch and Invoicing, Finished Goods Stock Control and Sales Analysis. Future systems will concentrate on the production functions.

The applicant should have a Cobol background, possibly linked with some On-Line experience, but more importantly, will have a proven career record in commercial systems, which offers evidence of the ability to take advantage of this rare and exciting vacancy.

The rewards mean that on top of the salary indicated above the successful applicant will be able to look forward to all the normal fringe benefits associated with a successful company, plus subsidised canteen facilities and relocation expenses where appropriate.

Ring Bill Baker
on 0742 738794 or 062 986 398
in the evening.

QUADRANT RECRUITMENT LTD.
Bank House, Queen Street, Sheffield

COMPUTER FINANCING

Specialists in New and Used IBM Computers
and tailored Leasing Plans

require

SALES EXECUTIVES

£15,000 +

We are a young dynamic and very professional company dealing in the Brokerage and Second User Market for IBM 370 range of computers and peripherals. We are currently looking for two Sales Executives who will be required to call upon IBM users throughout the UK and will report directly to the Sales Director.

Basic Qualifications — Enthusiasm, ability, self-motivation and above all someone who's not afraid of hard work. Knowledge of IBM computers and peripherals is desirable, but not absolutely essential as we have technical support available.

A second language is useful, as we are an international company and some overseas travel may be inevitable.

Rewards. Good basic salary plus high commission should generate earnings in excess of £15,000 per annum. Company car available. Excellent working conditions and all the usual benefits associated with a young company.

Interested parties should contact Stephen J. Measures, Sales Director.

Computer Financing
Standbrook House
2-5 Old Bond Street, London W1X 3TB
Telephone: 01-499 7955 or 01-491 4153

SYSTEMS ANALYSTS

£6500 - £8000 Plus Car Allowance

We are a supplier of DEC Mini-Computers to commercial users (predominantly in London) and require experienced staff to design, control and implement applications software to a high standard, using on-line techniques.

You will take complete responsibility for projects from post-sales work to implementation and will be dealing with all levels of people, e.g. Directors, Technical Teams, Users, Outside Resources.

Your skills will be augmented by suitable training, where necessary and this will provide you with an increasing role to play in a growing company.

If you would like to know more about us call Peter Munks, 01-398 7235/7346, Gamma Business Systems (London) Ltd., 27 High Street, Thames Ditton, Surrey.

CAPP ASSOCIATES group provides permanent and contract recruitment services to clients and applicants

BELGIUM

(BRUSSELS)

COMPUTER OPERATOR

Package C. £8K

(after tax)

NCR or IBM VS experience

We are retained to recruit a Senior Operator to work for a Consumer Bank based in Brussels, Belgium. The installation operates an NCR Criterion 8500 series machine, using the VRX operating system.

Earnings, which will include shift allowance for night working, will gross to a level which typically yields c.£8,000 after tax. This is much more attractive than UK salaries for the same type of positions; this is a permanent, not a contract job.

The Senior Operator needs good operations experience in preferably an NCR large machine environment or, alternatively, working under OS/VS on IBM hardware.

For further details please telephone or write quoting ref: CW 121-9J.

COMPUTER AND PROFESSIONAL RECRUITMENT CONSULTANTS **CAPP ASSOCIATES** LONDON AND MANCHESTER 01-686 9693

Computer Operations Production Manager

North of England c. £12,000 + Car

A unique opportunity has arisen to join the top echelon of one of Europe's largest commercial computer installations. Situated in the North of England the large multi-site, multi-processing configuration is an integral part of a successful and profitable business organisation.

The equipment is heavily utilised providing batch, on-line and real-time facilities to local and remote business users through an extensive and expanding communications network, together with a full time-sharing service supporting a substantial development work load.

Reporting directly to the Head of Computer Operations the person appointed will be totally responsible for the seven days a week, twenty-four hours a day operating of main-frames and associated equipment in a multi-site environment through multi-discipline shift staff.

Extensive experience of the management of large DP systems is a pre-requisite coupled with the ability to motivate a large staff, and a reflex appreciation of the pressures under which a successful business operates.

A total remuneration package in the order of £10,000 – £12,000 per annum is envisaged for this position. In addition, a company car will be provided, full removal expenses will be underwritten and there is an attractive fringe benefit package commensurate with the size of the organisation and the importance of this position.

TO APPLY:
Interested persons should write with career details to date to LEN CRAY at the address given below. Preliminary interviews will be held both in the North and in London in the next few weeks.

LORIEN COMPUTER SERVICES
OCS House,
Servia Road, Leeds LS7 1NJ
Telephone 0532 444185

Recruitment Consultants
(24 hour Ansaphone service)

EDUCATION DEPARTMENT
MONKWEARMOUTH COLLEGE OF FURTHER EDUCATION
Department of Science and Technology

APPOINTMENT OF LECTURER 1 IN COMPUTING AND DATA PROCESSING

Applicants should have commercial experience in programming or systems analysis. A professional qualification in Computing or Data Processing would be an advantage, as would an interest in micro-processors.

Application forms and further particulars available upon receipt of a stamped, addressed envelope from the Principal, Monkwearmouth College of Further Education, Swan Street, Sunderland, SR6 1ED.

Closing date for applications. 4th May, 1979.

L. A. BLOOM
Chief Executive

Borough of Sunderland

LEICESTERSHIRE

CHARLES KEENE COLLEGE OF FURTHER EDUCATION
Palmer Street, Leicester

DEPARTMENT OF SCIENCE AND MATHEMATICS — required for September 1st, 1979

LECTURER GRADE I

in Computing for G.C.E. 'O' and 'A' levels and City and Guilds Programming. Some G.C.E. 'A' level Pure Mathematics teaching may also be available to a suitable candidate. An appropriate degree is required and teacher training/experience would be preferred.

Specialist knowledge of Computing Science or Business Data Processing including one or more of Cobol, Algol, Basic and Assembler languages, would be an advantage.

Details and application forms are available from the Registrar, to whom application forms must be returned within 14 days of the appearance of this advertisement.

UNIVERSITY OF SALFORD

PROGRAMMER

£2823-£4632
ICL 2903, 32K EDS 60S

We require a COBOL programmer to join a small team of Analysts and Programmers working on the development, implementation and maintenance of commercial-type applications including financial accounting, job costing, management reporting, personnel and student records, and on-line file enquiries and updates.

Starting salary according to qualifications and experience.

Letters of application stating age, experience, qualifications, and present salary should be sent to the Registrar, University of Salford, Salford M5 4WT by 20 April 1979 quoting reference A/623/CW.

£4000 - £7000 +
North + Midlands
Analysts & Programmers
061-832 4184
(Transfer charges, if necessary)
Sampson Staff

A.M. Jacquard Systems

Mini-Computer Marketing in Europe

c. £12,500 + Car

An unusual opportunity has arisen for a professional computer person to join a fast growing mini-computer company in a senior marketing position based in High Wycombe. The company manufactures advanced micro-processor based automated office systems which operates data processing, word processing and communications simultaneously with equal facility. An extensive network of distributors has been set up throughout the world and the prime responsibility of this new appointment is to assist in appointing and supporting additional distributors in the U.K. and Continental Europe.

Extensive travel throughout Europe will be involved. The position will appeal to a technically competent, energetic computer marketing person already employed in a mini computer or consultancy organisation elsewhere.

This opening will appeal to someone who has sufficient marketing experience to appraise and appoint distributers to sell and install A.M. Jacquard products.

Candidates must be fluent in either French, Spanish or Italian, and are likely to have worked in the computer industry for at least 5 years. The ideal age range is 28-35 and a degree or equivalent qualification would be advantageous.

Salary is negotiable c.£12,500. The total remuneration package includes a motor car, generous pension scheme, free health insurance and other usual benefits. A bonus scheme is also operated.

In the first instance, please send your c.v. to, or request an application form from, Ron Burgess quoting reference RB/CW/236.

Jean Dennington Limited

Personnel Consultants,
14 New Burlington Street,
London W1X 1FF.
Tel: 01-734 6134.

IMPERIAL COLLEGE LONDON
DEPARTMENT OF COMPUTING AND CONTROL
INDUSTRIAL AUTOMATION GROUP

The Industrial Automation Group has recently taken delivery of a large Interdata 8/32 Computer (with 128K word store, disc and magnetic tape) to be used for simulation and control design studies of large industrial systems. A

COMPUTER MANAGER

is required able to ensure the system's smooth running, to liaise with the manufacturers on faults and to install system updates.

The successful applicant will have a good administrative ability is required. Knowledge of Fortran. Computer operating experience is essential and good administrative ability is required. Salary will be in the range of £4,359 – £7,005 including London allowance.

Applications to Dr. P. D. Spooner, **Department of Computing and Control, Huxley Building, Imperial College, London SW7 2BZ,** stating qualifications and details of experience by 28th April, 1979

IMPERIAL COLLEGE OF SCIENCE AND TECHNOLOGY

LECTURESHIP IN COMPUTING SCIENCE

The Department of Computing and Control wishes to fill a new lecturer post in computing science. While applicants are expected to possess a broad general background in this subject and be prepared to teach computing topics at undergraduate and/or postgraduate levels, more specialised knowledge is being looked for in one of two subject areas

(1) Computer systems, with experience in computer hardware, micro-processors, operating systems or networks and distributed processing.
(2) Data bases

The appointment will be made to an appropriate point on the Lecturer Scale £3883 to £7764 p.a. plus London Allowance and USS benefits

Applications including curriculum vitae, list of publications and names of three referees should be sent to the Head of Department of Computing and Control, Imperial College of Science and Technology, London SW7 2BZ as soon as possible.

UNIVERSITY OF SALFORD
Computing Laboratory

ELECTRONICS DEVELOPMENT ENGINEER

Required to assist the laboratory in the design and development of digital electronics services including micro-processor based systems. Applicants should have a degree in a relevant discipline and wide experience within the digital electronics field.

Salary on scale £3883-£6556 (under review). USS superannuation

Further particulars and application forms available from the Registrar, University of Salford, Salford M5 4WT, to whom completed applications should be returned by 27th April, quoting reference CL/68/CW.

NEW ZEALAND LAND OF OPPORTUNITY

ANALYSTS & PROGRAMMERS

The Company is a leading manufacturer and supplier of industrial, commercial and farming equipment in New Zealand. Products range from automotive parts to the largest earth moving machinery. A diversified product range together with related service organisations make this company a leading force in the country's development.

The installation is an IBM 370/125 based in Christchurch with a network of 18 terminals throughout the country.

They have vacancies for the following

- ★★**SYSTEMS ANALYST** (Finance and Administration) — with experience in Financial, Payroll or Shares Computer systems.
- ★★**SYSTEMS ANALYST** (Stock Systems) — with experience in Computer Stock Inventory Systems.
- ★★**ANALYST/PROGRAMMER** — with experience in an IBM DOS/VS COBOL environment.

All positions require a minimum period of four years' data processing experience on IBM/370 computers, together with a professional approach to user departments and the ability and personality to work in a team environment.

Rewards and benefits include: Excellent commencing salaries based on ability and experience. Assistance with relocation expenses and accommodation upon arrival will be offered to the successful applicants.

Mr Bob Jones, Managing Director of our New Zealand Associates, **I.D.P.E. Personnel Services Limited** will be visiting the U.K. for the purpose of interviewing prospective applicants during the last two weeks of April.

In the first instance, please telephone **Chad Stolper** of **Prescot Computers** at **01-242 2142** or, if you prefer, write to him at:

PRESCOT COMPUTERS LIMITED
6 Bloomsbury Square
London WC1A 2LP
Tel: 01-242 2142 **Telex: 23110**

Opportunities in the City

dilog

Permanent Positions

- ▶ 2 Analysts: Forex, Loans £8000+
- ▶ 6 Programmers: COBOL, CICS/VS £6-7000
- ▶ 5 Programmers: PL/1, QS £6000+
- ▶ 3 Programmers: COBOL, OS £6-8000
- ▶ 1 Programmer: FORTRAN £6-7000
- ▶ 1 Programmer: AIMS £6-7500

Contract Vacancies

DILOG has a number of exciting development contracts starting in May and June. PL/1, COBOL, BAL, CICS/VS or Honeywell level 6 experience needed.

Call in confidence
Rayleigh (0268) 747143

DILOG LIMITED
146 High Street Rayleigh Essex

William Key

SYSTEMS PROGRAMMERS

Berkshire & Manchester ● Substantial Salary + car

Due to expansion in the UK and Europe, our clients, manufacturers of large powerful computers, are now offering a number of excellent career openings for Systems Programmers:

MANCHESTER	1 Systems Programmer
BERKSHIRE	2 Systems Programmers, one with training experience.

If you have significant mainframe experience particularly involving on-site support of Operating Systems, Assembler and FORTRAN compilers, gained with a manufacturer, large user or software house, this could be your opportunity.

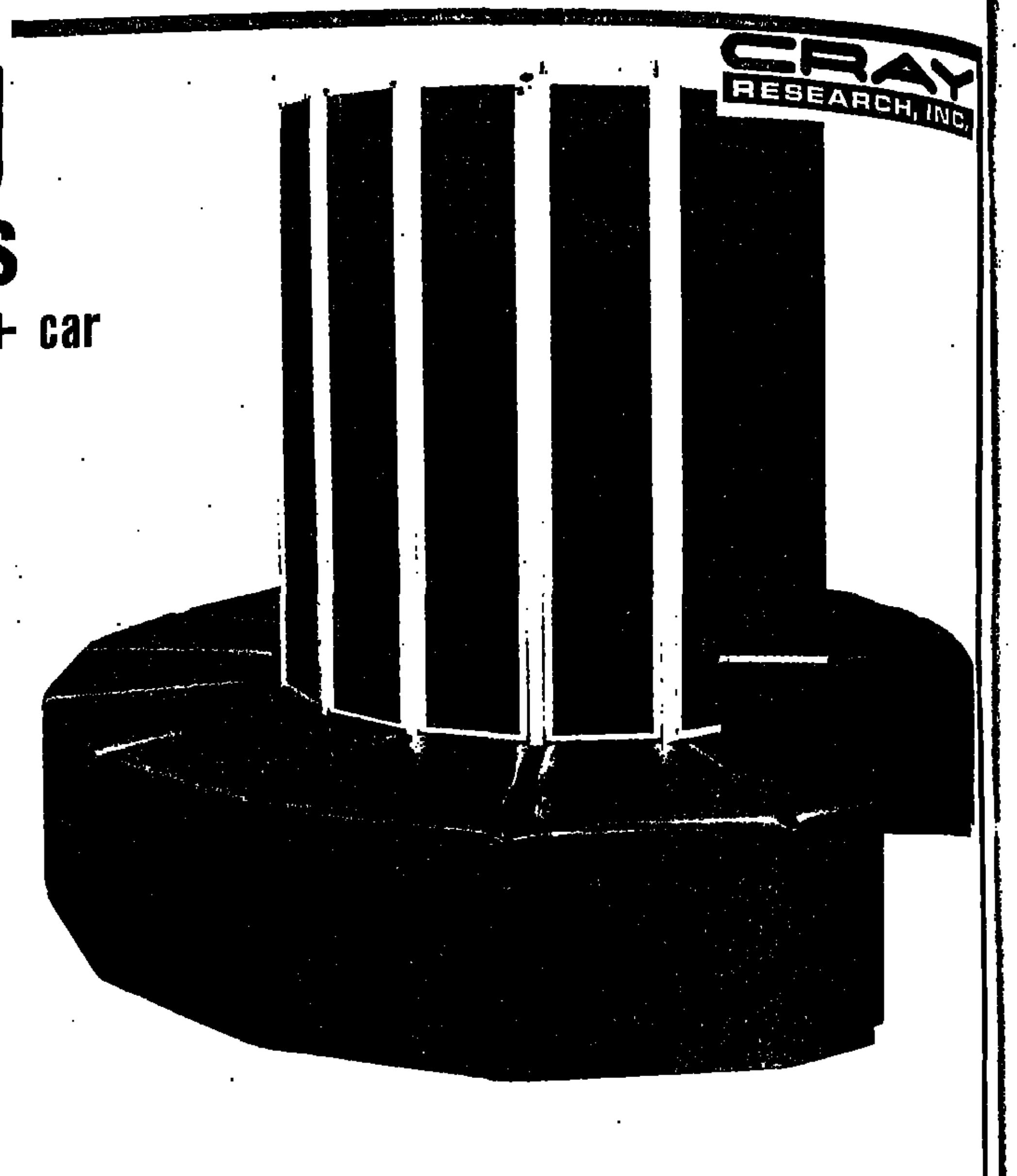
Large scale CDC, IBM or ICL experience would be advantageous.

Reporting to the Technical Support Manager you will have excellent opportunities for advancement on merit either in the System Software or in the Sales Support, Sales and Marketing areas.

Substantial salaries are envisaged, together with relocation expenses as necessary and a wide ranging benefits programme including company car and private medical scheme.

Interviews will be held in LONDON, MANCHESTER or BRACKNELL as appropriate, so telephone Richard Bulgin now on 01-493 2947 (day) or Rickmansworth 76143 (evenings and weekends), or forward a C.V. to him Ref. C.9744 at William Key & Partners, Freepost 4, London W1E 8UZ. No stamp required.

WILLIAM KEY & PARTNERS, 4 HALF MOON STREET, LONDON, W1



STOP PRESS!

Other opportunities —

CUSTOMER ENGINEERS (Ref. CW 9743) INSTALLATION PLANNING ENGINEER (Ref. CW 9746)
INSTRUCTORS SOFTWARE & HARDWARE (Ref. CW 9747)

VICTORIA APPOINTMENTS LIMITED

FOR THE BEST JOBS IN THE NORTH DON'T DELAY - PHONE VA TODAY!

NEW

MANCHESTER IBM

INSTALLATION

SYSTEMS ANALYST	**Salary up to £7,000**
ANALYST/PROGRAMMER	**Salary up to £5,250**
SHIFT LEADER	**Salary up to £4,200 + s.a.**

Our Client, a Manufacturing Group, is shortly due to install an IBM 370/138 under DOS/VS with CICS and DL/1. They now require a Systems Analyst to be responsible for the detailed design and implementation of new Computer systems, with particular emphasis on Production Control.

The successful candidate will have approximately 2 years' Production Control experience in Systems Design, together with the ability to liaise at all levels.

The Analyst/Programmer will be experienced in Systems Analysis and COBOL programming. He/she should have experience in setting up and maintaining data bases and data comm. using IBM hardware/software, preferably in Manufacturing Industry.

As Shift Leader, you should have a minimum 3 years' operating experience preferably with IBM equipment, with knowledge of JCL. The installation operates a 2 shift system.

While IBM experience for all these vacancies is preferred, full and detailed training is available. This is an excellent opportunity to join an exciting phase of this client's development.

Relocation expenses where appropriate.

Ref. 70379

For an application form in respect of these and many more vacancies contact Miss Val Halliwell

VICTORIA APPOINTMENTS LIMITED, 24 MOSLEY STREET, MANCHESTER 2
061-236 7319 (24-hour Answering Service) and 061-236 7417, Home 440 8134

SALES EXECUTIVES

it's a big challenge but it has equally big rewards and outstanding prospects

There are two appointments waiting for fully experienced professional Sales Executives, probably in the 25-35 range. You will have gained your technical knowledge in IBM, DEC, ICL, CDC, UNIVAC or similar mainframe or mini environment, and must be able to communicate at all levels.

One executive will be responsible for Government and Defence Sales — the other for Education and Research.

For the first year a basic plus guarantee totalling well over £10,000 will be provided according to experience — second year expectation is at least £20,000, and after that it's up to you. The sky's the limit! A company car and other substantial benefits are provided.

Some time will be spent at Head Office in Berkshire — so if you live in that area, or are willing to be relocated, that's an advantage.

The company, established and progressive, manufactures large scale computers which have proved to be very successful in both scientific and commercial markets.

What more can we say? It's an exceptional opportunity for those with the right background, ability and determination to be successful in a company that will give you every facility and full co-operation.

Arrange to see Richard Bulgin now — Today.
Ring him on 01-493 2947 (day) or Rickmansworth 76143 (evenings & weekends) or forward a C.V. to him Ref. CW9745 at William Key & Partners, Freepost 4, London, W1E 8UZ (no stamp required.)

WILLIAM KEY & PARTNERS LTD., 4 HALF MOON STREET, LONDON W1.

Substantial salaries + car

PLANNING ENGINEER (Ref. CW 9746) INSTRUCTORS HARDWARE and SOFTWARE (Ref. CW 9747)

SALESMEN

GUARANTEE £10K **QUOTA = £17K**

TAKE UP THE CHALLENGE
SUPERB OPPORTUNITY

Become a key member of one of the UK's most successful systems houses (£3,000,000 sales in first full year), utilising the highly successful DEC range of mini computers.

bunzl BUNZL DATA SYSTEMS LTD

A subsidiary of Bunzl Pulp & Paper Limited.

They offer the following benefits:

★ INITIAL GUARANTEE c. £10K
★ TARGET EARNINGS — £17K
★ CHOICE OF COMPANY CAR
★ EARLY MANAGEMENT OPPORTUNITIES
★ EXCELLENT SOFTWARE PRODUCTS
★ LARGE PROMOTIONAL BUDGET
★ GROWING CUSTOMER BASE
★ BIG COMPANY BACKING

DON'T HESITATE PHONE 01-485 5644 — NOW FOR EARLY INTERVIEW — QUOTING REF. CDW.

INSIGHT MARKETING & PERSONNEL
CONSULTANTS LTD.
72-75 MARYLEBONE HIGH STREET
LONDON W1M 4AJ PHONE 01-486 5644

ANALYST / PROGRAMMERS

HOLLAND/GERMANY **c £12,000+**

Informatix has been retained by several clients in Europe, opening in the Software services and manufacturing industries to assist in the recruitment of their D.P. staff:

There are openings for all levels of D.P. staff on both a permanent or one-year renewable contract basis. Our clients will give every assistance with accommodation. Preference will be given to Dutch/German speaking candidates.

Experience in the following areas are particularly relevant:

Minicomputers with two years + commercial programming; IBM PL1/COBOL/ASSEMBLER (preferably with IMS) UNIVAC 494 COBOL, SIEMENS 1000/2000 COBOL/PL1/ ASSEMBLER.

Applications range from commercial processing as custom-built systems and packages through to advanced Software and computer development.

Initial interviews will be held in London during April.

If you are seeking similar employment in the U.K. or Middle East, we will be pleased to assist you.

Ref. 15/1.

INFORMATIX UNITED KINGDOM AND OVERSEAS INDEX

Haven Informatix Limited
24 Grays Inn Road London WC1X 8HR Telephone 01-831 6055 Telex 299539 HAVEN G
RECRUITMENT CONSULTANTS

Microprocessor Software Design

Tayside, Scotland

NCR is the number two computer systems company world-wide.

A major part of its success is derived from microprocessor based special- and general-purpose terminals.

At Dundee we have developed a highly successful self-service banking terminal.

We now need additional Microprocessor Software Designers (male or female) of one to five years' experience to design new self-service terminals and to help determine the architecture of the next generation of terminals.

The people we require will be experienced in
- —Assembler programming
- —Mini/micro operating systems
- —Communication Softwear

The rewards at NCR include a negotiable salary, 35 hour week (paid overtime at premium rates), pension and life assurance schemes, generous relocation assistance and the possibility of U.S. travel.

At our unique location on the coast, close to all the premier Scottish golf courses, with ski slopes on the horizon, we offer a quality of life second to none.

In return, we expect professionalism, dedication and sheer hard work.

Interested? Then please write, giving brief career and personal details to:

**Ian Hume,
NCR Ltd. Engineering & Manufacturing
Kingsway West,
Dundee DD2 3XX.**

NCR

Make £25,000 p.a. and enjoy the best seafood in Europe!

Proost!

Programmer Telephony Software

Required to join a team to formally test Telephony Software

Knowledge of Assembler language coupled with a telephone, telex or data switching background would be ideal.

Candidates should be experienced in debugging Real-Time Software and must be willing to do shift work (6am - 10pm)

Ref: BJ 290279B

To take advantage of this great opportunity, call Geoff King at 01-953-4066 (office hours) or Aylesbury 630506 (7-9pm evenings)

Advance - and be recognised

Howard Organisation International Ltd.,
Employment Business Section, 8 Elstree Way,
Borehamwood, Herts.

HOWARD

DORSET/HAMPSHIRE

MANAGEMENT	
Proj. Mgr. (IBM)	To £9K
Sys. Mgr. (Sys. 32)	C £7K & c.c.
Proj. Control (Realtime)	To £10K
SYSTEMS	
Sys. Anal. (DEC Sys. 10)	To £8K
Snr. Anal. (IBM)	To £7½K
Snr. Anal (Mini)	C £8K
Bus. Anal (IBM)	To £7½K
Sys. Des. (IBM)	To £7½K
Snr. Anal (ICL)	To £6½K
Sys. Anal (IBM)	To £6½K
Sys. Prog (PDP)	C £6K
Proj. Leader (IBM)	To £6½K
Sys. Anal (Honeywell)	To £6K
Sys. Anal ICL	To £6K

ANALYSTS – PROGS	
Cobol Progs. (PDP Sys. 10)	
Anal/Prog (ICL)	To £7K
	To £6K + Mort.
Anal/Prog (Mini)	C £6K
Anal/Prog (PDP)	C £5½K
Anal/Prog (Sys. 34)	C £5½K
Anal/Prog (IBM)	C £6K
Snr. Progs (ICL)	To £6½K
Software Progs (Mainframe)	To £6½K
Realtime Progs	To £6½K
Progs. (numerous)	To £5½K
OPERATIONS	
Ops. Supvsr. (ICL)	To £7½K
Shift Ldrs. ICL	To £6½K
Shift Ldrs. (IBM)	To £5K + Mort.
Snr. Op. (ICL)	To £5½K
Operators (ICL)	C £5K

For further information about any of the above vacancies phone or write to Mike Boosley.

Sanderson 9A Princess Victoria Street
Clifton Bristol
EXECUTIVE RECRUITMENT
TELEPHONE 0272 39302

Systems & Programming Manager

BRISTOL

This new senior position (with responsibility directly to the Head of Data Processing) is being created to handle a demanding development programme including:

IBM 3600 Branch Terminal System
DL/1 Database
Enhancements to on-line Systems.

There is a development staff of 12 systems analysts and programmers, the main computer being an IBM 370/148, soon to be replaced by an IBM 4341.

The successful applicant, male or female, will probably be a graduate (or have an equivalent professional qualification) with at least 10 years' experience in the development of commercial data processing systems, preferably, but not necessarily, with a financial organisation. There will be an opportunity for career progression.

An attractive salary will be offered and there is an assisted house purchase scheme.

For an application form write, giving brief relevant details, to: Personnel Manager, Bristol & West Building Society, Head Office, P.O. Box 27, Broad Quay, Bristol BS99 7AX.

Bristol & West BUILDING SOCIETY
A MEMBER OF THE BUILDING SOCIETIES ASSOCIATION

HERTS AND NORTH LONDON

We specialise in D.P. Recruitment in the Herts/N. London area and the following vacancies are a selection from our current register.

EDMONTON (1)	Possibly the ideal installation — not too large, not too small, ICL 2904 based, informal, friendly, but very professional. The vacancies are for 2 programmers (up to £6,000 p.a.) with at least 1 year's Cobol experience (any machine) to join a close knit department engaged in the development of both real-time and batch systems
EDMONTON (2)	Opportunity for a trainee or experienced operator (up to £4,000 p.a.) to join a two-shift (6 a.m.-1 p.m., 10 a.m.-7 p.m.) 5 day week mini installation controlling a number of local VDUs. No previous operating experience is necessary, but as there is just one operator per shift, a high degree of dependability is essential
BARNET	Opportunity to join an installation known for its first-class working environment and progressive career structure. IBM 370 based, the vacancies are for 2 Systems Analysts, not necessarily IBM (up to £6,500 p.a.), a Senior Programmer experienced in PL1 and Assembler (up to £6,600 p.a.) and Programmers with either PL1 (up to £5,750 p.a.) or 12 months' Cobol wishing to learn PL1. Extras include a non-contributory pension scheme raising the total remuneration package substantially above the basic salary
POTTERS BAR	Situated just north of Barnet, an IBM 370/125 installation in the distribution industry has a vacancy for a Programmer/Analyst or Programmer with at least 1 year's Cobol experience (any machine) wishing to learn analysis — the company will train as necessary. Salary (up to £5,500 p.a.), a variety of projects are offered using the mainframe and a number of remote minis.

For more information ring:

HAYMARKET COMPUTING LTD.

**Tel: Cuffley (Herts) 4130
up to 6.30 p.m.**

SHEFFIELD CITY POLYTECHNIC

DEPARTMENT OF COMPUTER SERVICES

SYSTEMS PROJECT LEADER

Salary Scale: £4920-£5748 plus 312 salary award

The Systems Project Leader will lead a team of two senior system programmers and two system programmers in providing operating system software [illegible] 370/135 and special purpose minicomputers. OS/VS1 is operated at the latest release level and a general purpose timesharing service is provided. This is an expanding service and there is ongoing development of system software. Working conditions are excellent and the work challenging.

A person with demonstrated system support experience is required.

Requests for an application form in writing only please to the Recruitment Section of the Personnel Department, Sheffield City Polytechnic (Dept CW), Halfords House, Fitzalan Square, Sheffield S1 2BB. Completed forms should be returned by 27th April, 1979.

LOUGHBOROUGH TECHNICAL COLLEGE

LECTURER II IN COMPUTER APPLICATIONS

from September, 1979.

Applicants should be suitably qualified, preferably teacher trained, and have practical experience in data processing or an allied field.

Salary according to Burnham Further Education scale (Lecturer II — £4101 to £6558) with placing according to qualifications and experience.

Further particulars from the Principal, Loughborough Technical College, Radmoor, Loughborough, Leics. LE11 3BT (Tel 0509 215831).

Dept. of Medical Physics and Bio-Engineering

UNIVERSITY COLLEGE HOSPITAL MEDICAL SCHOOL

PROGRAMMER A

Applications are invited for the above post. The successful candidate will join a small group responsible for providing programming advice to research staff in the Medical School and will supervise the day-to-day operation of the PDP 11 based remote-job-entry terminal linking the Medical School to the major computer installations of London University.

A good knowledge of Fortran is required and experience in statistics would be an advantage. The post offers the opportunity to gain wide experience in scientific medical computing and would be suitable for a new graduate interested in a career in computing.

The salary scale for the post is £2292 to £27[illegible] plus £[illegible] London Allowance.

For further information [illegible]

SYSTEMS ANALYST
PROGRAMMER
SYSTEMS PROGRAMMER

BEDFORD **IBM 370/138**

George Fischer (GB) Ltd is part of an international engineering group which operates through four separate companies within Gt. Britain. The Computer Department provides a service for those companies based on an IBM 370/138 operating both batch and TP systems using DOS/VS and SHADOW.

We are currently concluding the implementation of a major Order Entry System. New systems are scheduled in the areas of Production Control and Accounting with work commencing shortly. In order to provide additional development support for these new applications we are seeking for a Systems Analyst with 2/3 years relevant experience in either of the above application areas.

We are also seeking a Programmer with 2 years' experience, preferably PL/1, but suitable COBOL experience will be considered.

For our Operations Section we require a Systems Programmer who will be responsible for the maintenance and upgrading of all systems and application software. The position would suit a Programmer with systems software experience of a similar machine or an Assembler Programmer seeking the opportunity to enter systems programming.

The positions are all based at Bedford, which offers excellent local amenities and easy access to motorway facilities. An attractive salary will be offered which includes participation in a productivity bonus scheme.

Applications should be made to:

GF

**The Personnel Officer,
George Fischer (Great Britain) Ltd.
Kempston Road, Bedford
MK42 9DH
Telephone: Bedford 55291**

SMR Sales & Marketing Recruiters Ltd
Victory House, 99 Regent Street, London W1R 7HB

Sales Executives

If you are seeking to advance your career rather than simply looking for another job then you need the objective guidance of an organisation which is totally conversant with all aspects of sales and marketing within the computer industry.

Although our activities are devoted to this area, we are not merely a recruitment organisation; we are the only company within the industry which also provides sales training, market research and product promotion.

We understand sales people because we have done the job ourselves for a total of over [illegible] years, and we know where the best [illegible] because we have access to all the significant [illegible]

[illegible]

[illegible]

A Sales & Marketing Services Company
TRAINING, PROMOTION, RESEARCH, RECRUITMENT

THE SALES AND MARKETING BIT

The right man is too busy for time-wasters

THE opening of a sales conversation is its most critical element, whether it be in the context of a new prospect sales call or a job interview (they are both the same situation in my book!).

First there is that instantaneous judgment based on an immediate impression, the classic "Would I buy a second-hand car from this man?" that subsequently flavours the ensuing dialogue. A loud tie, a crumpled collar, scruffy hair, a trendy suit can create as big an emotional obstacle as arriving an hour late.

Having created that highly subjective personal image, the salesman is then possibly at one of the most critical stages of the selling process, the opening gambit. How does he launch the verbal interaction?

Like this perhaps:

"Good morning Mr Prospect, sorry to be late, I got held up at the new by-pass. The traffic was terrible. It was just as bad last night. Forest/County match. Could hardly move. Good game mind you. Cloughy's done wonders. Should never have left Derby though. Did you go . . .?"

Or maybe this:

"Good morning Mr Prospect, my name is Peter Owt of The Average Mini-Computer Company. We were founded in 1812 by Fred Smith who unearthed some golden plates whilst playing golf with Paul Raymond one Wednesday morning. The oracle inscribed therein commanded him to go forth and bring a new dawn to the world of data processing. However, some initial problems in generating capital caused the company to delay its initial product launch until last week!"

These may appear to be wild exaggerations, but I can assure you that every day hundreds of salesmen are starting out a sales call with similarly irrevelant or meaningless banter.

Let's face it, the prospect knows why the salesman has called. He is not expecting a missionary, a social worker, or even Eamonn Andrews. He is expecting to meet someone who will try and sell him something. The salesman should at least be courteous enough to confirm the buyer's expectations.

So what is the best way of opening a sales conversation other than with the customary salutations? The answer is simple, and results directly from effective sales preparation particularly related to the prospect's business situation.

"I understand that your principal area of business activity is related to the mass production of electrical goods. I imagine this demands a lot of management skill particularly related to the control of stock and production. What methods do you currently employ to maximise efficiency in these areas?"

Or, "My attention was drawn to the recent Press announcement of the contract you have won for the design of a wide range of complex structures. What computer-based technique do you currently use? What type of analysis and design is involved? Are you using infinite-element techniques? Who is responsible for the day-to-day application of computer methods?"

What is your current expenditure or technical computing? What proportion is spent with external suppliers?

If the salesman is calling on the right man, that person will be too busy to indulge time-wasters, and will really appreciate someone who quickly gets to the point.

The salesman has no more effective way of winning the buyer's attention and respect than simply getting on with the business he came to discuss, in a well-informed manner. After all, if there is anyone with more to benefit from the effective use of time than the buyer, it's the salesman himself.

TRADER

PRODUCT NOTES

Security lock alarm

THE Combalarm digital security lock controller, from Clarke Instruments, has been redesigned as the Combalarm 906. The key and control box is mounted near the door or locker to be secured, and the lock can only be released on receipt of the correct four digits, keyed in the correct sequence.

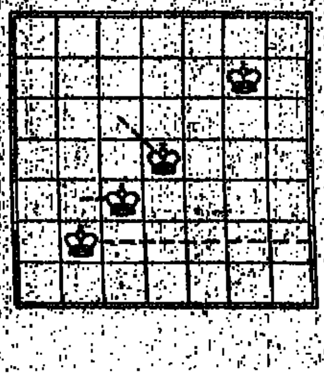
The integral alarm will sound if a wrongly keyed number is entered, but accidental error can be corrected by use of the "cancel" key, if pressed before the "enter" key. The code can easily be changed whenever necessary. The Model 906 is weatherproof and the price is £160.

Clarke Instruments Ltd (CW), 91a High Street, Camberley GU15 3RN. Tel: 0276 27105.

Brochure

A BROCHURE that provides an introduction to the Post Office Prestel service and Pye's Visa business viewdata terminal is available from Pye TMC Ltd, Swindon Road, Malmesbury SN16 9NA.

Puzzle Answer



Ascii through the Logic Gate

An epic in 32K words, by Richard Forsyth

Block 32 (Trailer Block)

Hex, Cleo and McNull are in the underworld. Hex has been given responsibility for a crucial stage in the animation of BOSS (Bionic Operating System Supervisor). This software is to be transferred from electronic equipment to living tissue via the genetic programming technique invented by Mike Rose – a transformation that will turn the animal kingdom into a biological computing engine, rendering the Future System effectively immortal. It is the greatest amino acid trip since Genesis.

CLEO moped about gazing at Rose's specimens, wondering how to avert disaster. McNull was still sitting cross-legged in a lotus posture underneath the antlers of a Canadian moose, withdrawn from reality.

When Hex finished coding he began tapping the keys on Rose's apparatus. As he tapped, pulses shot down the twisted wire and released substances that shunted hydrocarbons into place, forming the building bricks for new life; but no change was visible.

The job was quickly done.

"Ready," he called to Rose. He was satisfied with his loader program as a piece of software, though he still doubted that its "hard copy", the data-gobbling virus, would work as planned.

"Fine," said Rose. "We'll take it to BOSS for the down-line loading."

He made his exit with Hex. The door shut behind them and Cleo heard the key turn. She was locked in with Neddy and the still-senseless McNull.

Rose led Hex down to ground level. It was Hex's first chance to look around. To him it seemed a veritable cathedral of computation. The robots hurrying about were acolytes and junior priests performing ritual devotions in various side-chapels. Rose was the archbishop leading him to the fenced-off area on which all this computer worship focused – the high altar of data processing. Even the cooling pipes at the far end of the cavern took on the appearance of an enormous church organ. The only ecclesiastical role he couldn't pinpoint was his own. Was he one of the annointed faithful about to partake of the sacrament, or was he a heretic being led to the stake?

At the electrified wire which surrounded the holy of holies Rose held up his wristband to gain access. Inside, they were confronted by a metal sphere about one metre in diameter with a reflective surface polished as smooth as a mirror. It floated just above head-height without apparent support.

It glided wordlessly towards them. A section of its outer layer slid back. Rose held up the bottle and placed it inside. The panel closed again and the sphere took up its former station, hovering about two metres off the ground. It began to revolve, slowly at first but increasing in speed until it was too fast even to see any movement.

They waited 15 minutes. Then the floating globe stopped spinning and approached. The aperture re-opened. Rose's hands trembled as he reached up to take the bottle of juice.

"Is that all there is to it?" asked Hex, a trifle disappointed.

Rose just held one finger to his mouth. Once outside, he recovered his tongue. "Amazing, isn't it? Each droplet now contains a million megabytes in genetic code – mutations that will change the face of the universe."

They returned to the lab. McNull was yawning and stretching. Neddy was using tongs to extract some surgical instruments from a sterilizing unit. Cleo looked forlorn.

"What's the next step?" Hex asked, eager to see results.

"The initial incubation period," replied Rose. He took the bottle over to where Neddy waited. Neddy handed him a syringe. He stuck it through the rubber bung and drew up some fluid. "Until the computing virus is fully viable we need a living host. I was going to tell Neddy to volunteer, but this young girl has arrived at an opportune moment."

He walked towards Cleo. "Kindly roll up your sleeve and bare your arm," he requested.

"Is that necessary?" queried Hex.

"No. It's essential," Rose retorted.

McNull butted in. "Allow me to act as guinea pig," he proposed gamely. "I'm as human as the next man."

Rose looked him over like a farmer appraising a prize bull at market. "No," he said. "The girl's in better condition."

"Hold it," objected Hex, "you can't just treat her like a battery hen."

"Don't be sentimental. None of us will survive if this goes according to plan. It doesn't matter who goes first. In fact she is honoured."

"I refuse to co-operate," proclaimed Hex. "It's unethical."

"Big deal," responded Rose sardonically. "Your part in this is over. Next time you feel like being ethical, get your timing right." He turned to Cleo. Neddy held her left arm. She looked at Hex imploringly, too dazed even to struggle.

As Rose prepared to inject the virus into her veins, Hex clamped both hands round his throat in a vice-like grip. Rose shook sideways. His face began to go purple. A wheezing breath escaped his lips: "Eliminu lin!"

With two strides Neddy was on him. He prised Hex's fingers from Rose's neck with no more effort than unfastening a zip and flung him bodily across the floor. Hex skidded along and crashed head-first into the door, knocking it open. Momentarily stunned, he lifted himself onto one knee. Neddy was bearing down on him; behind the ape's looming bulk he saw Rose, getting ready again to plunge the needle into the petrified Cleo.

There was no other recourse. From the depths of his memory he retrieved Dr Null's gigotic induction program, wiped his mind of all current processes, cleared the processor status word, disabled interrupts and executed an unconditional branch to location 0000H.

Neddy observed that the creature he had been ordered to destroy had sprung up like a startled deer and dashed through the door. He gave chase; but Hex was possessed. Running with literally superhuman speed he raced down towards the floating ball that housed BOSS. He beat Neddy to the protective cage and shook the grille violently with both hands. Instead of being electrocuted he drew new strength from it and seemed to glow with power. In a voice reverberating with Dr Null's Russian accent he called out through the fence: "What is the square root of minus zero?"

With a resounding crash the silver sphere dropped to the floor and fractured. Little coils of acrid smoke filtered out through the cracks. All the robots in the cave stopped dead.

Microseconds later Neddy pounced; but he was too late. He grabbed Hex but picked up only dead weight in his powerful arms.

Now the lights were fading. The electricity generators were running down. The vast hall was silent. All robotic activity was suspended. Humping the lifeless body over his shoulders Neddy picked his way back to Rose's lab where a lamp was still shining.

Cleo was rubbing her arm. Rose himself lay prostrate on the floor. The half-empty hypodermic, its needle bent and blunted by his fall, had slipped from his grasp. As Neddy entered he managed to utter three words. "Protektu la junulinon."

Neddy dumped his load and knelt solicitously over his fallen master; but he could not revive him. After a few more gasps life departed from Mike Rose.

Without further ado Neddy picked Cleo up under one arm and jumped onto the bench. He forced open the air vent through which she had originally plummetted and began to climb up it.

"Wait for me!" cried McNull, clambering up after them.

Neddy looked down at the figure whose shortness prevented him scrambling clear and paused for thought.

"Please don't leave me here," begged the distraught human.

Neddy leaned down and hauled McNull off the table. The three of them clambered hastily upwards. They reached the mine tunnel after much effort and ran towards the daylight.

As they emerged into the open air, the mountain shook. Far below, the earth was racked by the awesome violence of the ultimate combinatorial explosion. The Future System was a thing of the past.

Was Rose's unfinished job enough to infect Cleo? We may never know.

© 1978, Richard Forsyth. Rour

GALLAHER LIMITED

HAVE THE FOLLOWING COMPUTER VACANCY

H 66 COMPUTER OPERATOR

Gallaher Limited one of the largest tobacco manufacturers in the U.K. require a Computer Operator to work at their computer installation at Northolt.

Aged 18 years plus. To operate H66 and associated computing/off line equipment. Applicants should have relevant operating experience in a large scale computer environment (H66/6000 experience an advantage).

Hours of work are on a 3 shift system.

Starting salary at 20 years is £5131 per annum inclusive of shift allowances and productivity payment. (Due for revision July 1979).

Conditions of employment include 20 days' annual holiday, annual bonus paid at Christmas and a good contributory pension.

For further details please contact: Personnel Department, Gallaher Ltd., Rowdell Road, Northolt, Middlesex. Tel: 01-845 2366.

DATA PROCESSING CONTROLLER
liverpool city centre

THE COMPANY: Established Liverpool Shipping Agents who at present have centralised accounting system based on VRC 400s will shortly be installing an NCR 8250 Computer.

THE POSITION: Data Processing Controller responsible to Accountant for overseeing implementation of established packages on an NCR 1-8250 Computer, and day-to-day control of those systems. Configuration includes 4 VDUs, 10 Mb Disc Storage and 125 LPM Printer using multiprogramming and on-line terminals. Appointment will be for about 2 years with remuneration negotiable at level appropriate to the position reflecting also duration of appointment.

THE CANDIDATE: The successful applicant will have had proven experience in implementing and controlling systems on a similar machine, and will be fully conversant with financial accounting principles. The position is likely to attract an experienced Analyst or Analyst/Programmer with Computer Management ambitions.

Applications will be treated in confidence. Please telephone for further details to Mr. E.D. Jones at 051-236 4871, or write Bahr Behrend & Co. Ltd., P.O. Box 28, India Buildings, Water Street, Liverpool L69 2BW.

DENJON INTERNATIONAL
require a
FORTRAN PROGRAMMER
for Survey Analysis applications.

Should have both mainframe and mini-computer experience. Some knowledge of assembly and interactive programming a help.

Salary negotiable according to experience.

Please contact Keith Hughes at Denjon International, 11 Denmark Street, London, WC2 (Tel. 01-240 1686).

WANTED URGENTLY
CORAL, PL/1
RPG II PROGRAMMERS
ALSO ANALYSTS
You want the jobs! We have them!
VIP Consultants
[illegible]

canterbury
City Council

Systems Analyst/Programmer

Salary £4,773-£5,073 (inclusive)

Applications are invited for the above position at the Council's purpose built Computer Centre on the outskirts of Canterbury. The Council have an I.C.L. computer which is linked to the main Council offices for on line V.D.U. enquiries to the Rating System. Further on line systems are planned and person appointed will become involved in this area (with training given where necessary). Applicants should have a minimum of two years' experience on C.O.B.O.L. programming using Direct Access techniques. A knowledge of N.I.C.O.L. and I.C.L. soft ware utilities would be an advantage.

Consideration will be given to housing accommodation and a generous disturbance allowance scheme is in operation.

Closing date: 26th April 1979. Interview date: 11th May 1979.

Application forms may be obtained from the Personnel Officer, 3 Marlowe Avenue, Canterbury, Kent, CT1 2QN. Tel. Canterbury 51755 Ext. 12.

SITUATION WANTED

On West Coast of America, for Systems Programmer with 4 years' experience of OS/VS1, CICS, Assembler, IBM 370/158. Currently employed within insurance field. Please reply to J. R. Patel, P.O. Box 42273, Fordsburg 2033, Johannesburg, South Africa.

ata Computer Recruitment
A division of ATA Selection and Management Services, recruitment consultants to Industry and Commerce since 1962

BRISTOL
PLAN Programmer to be trained in BASIC
c £6000

Our clients, currently in the headlines, require for their Bristol office a PLAN Programmer who wishes to extend his/her experience to MICRO/MINI computers and enjoys working as part of a small informal team.
The successful applicant will be responsible for a wide range of financial systems catering for all sectors of industry and commerce. In addition he/she will be trained in BASIC and be involved in the development of a variety of solutions utilising computers.
It is essential that applicants should have a solid PLAN programming background and be accustomed to working to strict schedules. As RELOCATION ASSISTANCE is provided this is an ideal opportunity to move to one of the most picturesque areas of the country and into a stimulating environment.
For a confidential discussion ring 0272 211035.

PL/1 PROGRAMMERS
To £6000 + MORTGAGE SUBSIDY
Large installation running a 370/158 under OS/VS1 require experienced PL/1 Programmers. BRISTOL. Ref. 428.

SENIOR PROGRAMMER
To £6000 + SALARY REVIEW JULY
Experienced Cobol Programmer required to consolidate existing team. Must be familiar with CICS & DL/1. Based Nr. BATH. Ref. 431.

SYSTEMS ANALYSTS
To £6000 + Salary Review July
Some travel to user sites. Must have CICS and DL/1 experience. Based Nr. BATH. Ref. 430.

PROGRAMMER/ANALYST to £6000
Cobol and/or RPGII Programmer with some analysis experience. Based AVONMOUTH. Ref. 440.

PROJECT ANALYST To £6000
Ideally a business analyst with experience of computerised systems on ICL Hardware. Based WITLSHIRE. Ref. 433.

For further information telephone 0272 211035, alternatively write to:
ATA COMPUTER RECRUITMENT
Equity & Law Building
36/38 Baldwin Street, Bristol BS1 1NR
SOUTHAMPTON (0703) 37555
LONDON (01) 637 0781
MANCHESTER (061) 832 5866
BIRMINGHAM (021) 643 1904
BRISTOL (0272) 211035
EDINBURGH (031) 226 5381
CRAWLEY (0293) 514071

UCSL Unilever Computer Services Limited

PROGRAMMER/ANALYSTS £5500 to £7000.

We are one of the country's leading Computer Service Bureaux. Due to substantial demands for our services, we now require several more Programmer Analysts to join our small intimate teams, working on a variety of new projects.

If you have 2 years or more experience of OS COBOL or PLI and want the opportunity of gaining experience of sophisticated on line Database Systems, whilst rapidly expanding your career, TELEPHONE 01 240 3223 QUOTING REF C.W.1. TO ARRANGE AN IMMEDIATE INTERVIEW.

SOFTWARE ENGINEERS
PROGRAMMERS
£4000-£8000
Excellent relocation package

To work on processor controlled switching systems and computer controlled traffic applications using advanced technology. Applicants should have experience of Telecommunications switching or Real-Time Computing. For the programming positions a knowledge of CORAL would be particularly desirable.

For further details and immediate interviews telephone 01 242 3223. Quoting Ref CW2.

1900 & 2900
APPLICATIONS PROGRAMMERS
A golden opportunity
to branch into systems
£4.5K to £7.5K

If you have experience on Assembler Level Languages on 1900's or 2900's we need you to work on Software Development for our 2900 systems. Full retraining will be given where necessary. For further details and immediate interviews Telephone 01 240 3223. Quoting Ref CW3.

DATA PROCESSING SUPERVISOR
Basingstoke from £6,000 p.a.
POSIDATA LIMITED

We are installing our first business systems computer (an IBM System 34) for sales, financial, production and stock control applications, and we need a D.P. Supervisor to implement and maintain the system. This is an excellent opportunity for a self-starter, with about 3 years' RPG II programming experience, to run his/her own show. Experience of data processing in a manufacturing environment is essential, and of installing an I.B.M. System 32 or 34 is desirable.

We are specialists in Computer Numerical Control Systems for machine tools — an expanding firm in an expanding technology (we move into larger premises in Basingstoke later this year). We can offer excellent conditions and career prospects to the right man or woman. For further details and prompt interview phone John Harper on 01 240 3223 quoting Ref CW4.

PROCESS CONTROL OPPORTUNITIES FOR PROGRAMMERS

Our client is part of a large internationally based group of companies whose business is process control and instrumentation. Due to continuing success in developing, manufacturing, and selling a range of micro and mini computer based systems for a variety of process control applications – they are now expanding their operation in Hertfordshire. There are vacancies in the development department for software engineers to work on a variety of challenging projects.

SOFTWARE ENGINEERS £5000 to £7500

For development of process control software packaging and mini and micro computers. One position will be largely concerned with the continuing further development of existing proprietory oriented languages. Successful candidates will be qualified to degree standard in an engineering or scientific subject and will have experience of writing assembly language programmes for real time applications. Familiarity with CORAL or PASCAL would also be an advantage.

For immediate interviews telephone 01-240 3223 quoting ref C.W.5.

SYSTEMS ANALYSTS
Support the BC/7 in London £7½K package

Sperry Univac, successfully launched the BC/7 small business computer last year and are now moving into the second phase of the growth plan.

We would like to meet Systems Analysts who have experience of design through to implementation on commercial applications, preferably gained on Mini, VCR or Bureaux, either with a user or manufacturer.

There will be plenty of customer contact; involving pre sales investigation, presentation and the recommendation of appropriate system packages. You must enjoy installation and problem solving and have the ability to act as a consultant to the sales executive and customers alike.

For further details and immediate interview telephone 01 240 3223 quoting Ref C.W.6.

SPERRY UNIVAC

PROGRAMMERS
Expand your career at our client's expense
£4.5K to £5.5K
City

Opportunities have arisen with one of our clients for programmers with at least 12 months programming experience, preferably under OS, who wish to widen their knowledge of systems.

The successful candidates can expect to rapidly expand their career working in a friendly environment.

For further details and immediate interviews telephone 01 240 3223 quoting Ref C.W.7.

PROJECT LEADER
(Software)
£7½K to £8½K
Berkshire

This is an excellent opportunity for a senior Analyst/Programmer to lead a highly motivated team, currently working on a major telecommunications project.

Applicants should have a minimum of 5 years software experience in a real time environment. Knowledge of CORAL would be useful.

For full details and immediate interview telephone 01-240 3223 quoting Ref C.W.8.

COMBYTE SERVICES LIMITED
Combyte Services Limited
Suite 74-76
12-13 Henrietta St.
Covent Garden
London WC2E 8LH
Tel. 01-240 3223
Licence No. SE(A)2648

01-240 3223